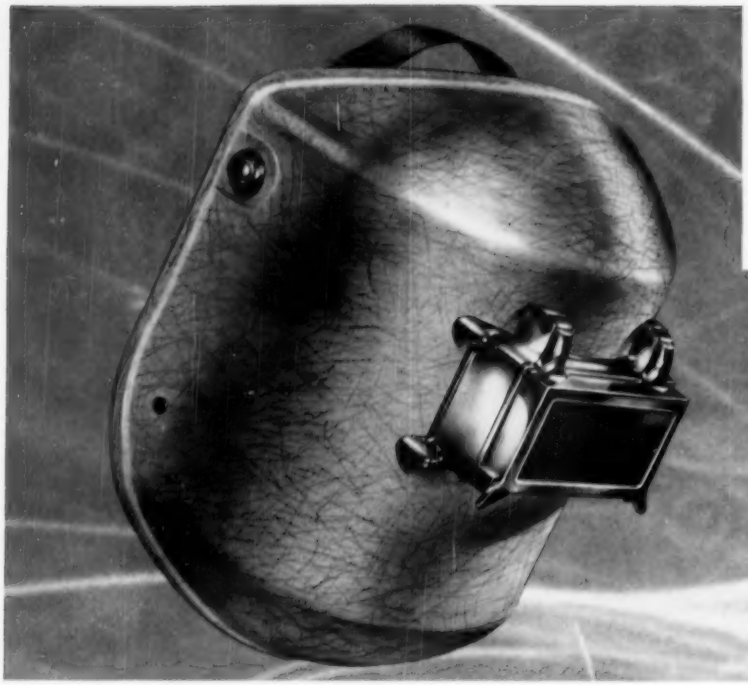
Safety Maintenance

EST. 1901 • AMERICA'S PIONEER MAGAZINE IN ITS FIELD • AUGUST, 1957 • 50¢

Published By Alfred M. Best Company, Inc.



Protection For Welders

AO "Weld-Cool" the First

WHITE FIBER GLASS WELDING HELMET

. . . Cooler — Reflects 70% of Radiant Heat

Here's the answer to the plea of welders for a cooler helmet . . . AO 9702-W and AO 9706-W Weld-Cool Helmets made of Fiber Glass. Because these helmets reflect 70% of radiant heat from their white exterior surface, welders are 50% cooler and far more comfortable . . . more efficient also! Aluminized plastic coverplate, AO 168AL also available . . . provides exceptional coolness in eye area. Helmet is black inside to eliminate any possibility of diffusion of harmful light rays and to permit easy cleaning. Reflective, cool, aluminum glass holder. All helmets flame resistant. Stationary or lift front. Also available with dark gray shell as No. 9702 or No. 9706.

Quick Facts — *New plastic*, easy floating, rear adjustment, positive lock headgear — locks securely once set to proper head size. • Adjustable friction joint • Exceptional ventilation • Adjustable vulcanized fiber chin rest for easy alignment of helmet in line of vision • Lightweight, exceptionally strong • Nonwarping and moistureproof, particularly recommended for inert gas, shielded arc and outdoor welding.

PREFER VULCANIZED FIBER?

AO Presents 4 Welding Helmets made for the Job!

All 4 helmets have rear positive lock adjustment, adjustable chin strap and friction joints identical to AO Fiber Glass Helmets. All helmets available upon request with Noviweld or Filterweld plates. Helmets dielectric and seamless. No. 944 imitation leather or No. 945 genuine leather sweatband available upon request.

No. 9440 (shown) — Excellent protection for throat, neck and head. Standard aluminum, lightproof glass holder No. 91085 with plastic insert for insulation. No. 94 easy floating headgear with positive lock adjustment.

For complete details on this helmet, other AO Vulcanized Fiber Helmets (No. 9460, 9890 and 9270) and AO Fiber Glass Helmets write for new Brochure S-6311.

AO Sweatbands increase worker comfort and protection, decrease accidents. Check your needs!

American AO Optical
COMPANY
SAFETY PRODUCTS DIVISION

Always Insist on AO Trademarked Safety Products. Your nearest American Optical Safety Products Representative can supply you.

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES

(For details, use Key # G-1 on card on page 1)

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FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Reflecting Arm Bands 360
Olympic Glove Co. Illustrated bulletin describes arm bands and palm patches made of a light-reflecting fabric to make emergency crews, public utility workers, policemen, and others who work near highways at night more visible to oncoming headlights.

Heavy-Duty Cup Goggles 361
Willson Products, Inc. Twelve different types of eyecup goggles for heavy-duty work are described and illustrated in this 4-page folder. While the models are divided into two general groups, for welding and for chipping and grinding, types for chemicals and dust are included.

Protective Clothing 362
A. J. Tower Co. A combined price list and illustrated catalog of outdoor and industrial protective clothing, including items such as raincoats, jackets, overalls, coats, aprons, pants, hoods, hats, etc. made of neoprene and rubber.

Plastic Eyeshield 363
U. S. Safety Service Co. This bulletin illustrates and describes a ventilated plastic goggle with soft, flexible edges that fit snugly to facial contours, with a one-piece clear or green lens for general protection against impact, dust, and liquid splash.

FLOOR MAINTENANCE

Concrete Protective Coating 364
L. Sonneborn Sons, Inc. Uses for a fast-drying, synthetic resin, liquid protective coating for concrete floors are described in this 4-page brochure. It outlines the product's resistance to oils and its ease of cleaning. Included is a useful chart of its resistance to 35 chemical substances.

Slip Preventer 365
Lamco Chemical Co., Inc. This bulletin and laboratory report describe a combination cleaner, sealer and polish with a high slip resistance. Product is suitable for either waxed or unwaxed floors of asphalt, rubber, vinyl, linoleum, or terrazzo.

Asphalt Tile Maintenance 366
Multi-Clean Products, Inc. Comprehensive bulletin gives step-by-step instructions for initial treatment, daily maintenance, and the restoration of asphalt tile floors. It includes materials information, equipment specifications and a list of do's and don'ts.

Garage Oil Absorbents 367
Oil-Dri Corp. of America. Uses for oil and grease absorbents in gas stations, garages, automotive repair shops, and car dealers are shown in this illustrated bulletin to prevent accidents and fires.

Gratings and Stair Treads 368
The Globe Co. Well-illustrated 8-page brochure gives full specifications for several types of open gratings and stair treads, including welded types and non-slip serrated edge types. Included are tables showing safe loading weights.

HEALTH PRODUCTS

Athlete's Foot Control 369
Onox, Inc. Four-page bulletin gives the reasons why the skin-toughening method, utilizing a sponge rubber mat saturated with a special solution, prevents athlete's foot. The brochure tells how the fungus infection develops and answers questions about the use and cost of the foot mats.

Gravity Soap Systems 370
Bobrick Dispensers, Inc. This set of typical installation drawings for six basic types of gravity soap systems, both exposed and concealed piping types, shows how soap tanks should be located, what cleanout fittings are needed, where to locate soap valves, etc.

Skin Creams & Cleaners 371
Boyer Campbell Co. A catalog page describes three skin protective products: two protective creams and a waterless hand cleaner. One of the creams resists organic liquids such as kerosene, chlorinated hydrocarbons, paints, cutting oils, etc.; and the other is for protection against water and water-dissolved materials.

Salt Tablets 372
A. E. Halperin Co., Inc. This bulletin describes and illustrates four throw-away dispensers for slow-dissolving salt tablets and salt-and-dextrose tablets. Also described are regular containers, permanent dispensers, and cellophane-wrapped strips of tablets.

Soap Spray for Showers 373
Huntington Laboratories, Inc. Folder describes a new type of soap dispensing system for shower rooms, equipment which sprays liquid soap directly onto the body. Folder tells how the system promotes cleanliness and safety, reduces maintenance, and is economical.

FIRE PROTECTION

Automatic Sprinklers 374
Automatic Sprinkler Corp. of America. How an investment in automatic sprinkler protection can amortize itself out of insurance savings and bring other economic benefits is explained in this 8-page bulletin, which includes actual examples of systems that paid for themselves in from 2½ to 8 years.

(Continued next page)

SPECIAL OFFER BELOW VALID ONLY FOR THREE MONTHS AFTER PUBLICATION DATE

READER'S INQUIRY CARD

HOW TO GET FREE DATA! **(No Postage Required)**

ADVERTISED PRODUCTS: Just insert the key number shown under each advertisement in the boxes below.
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KEEPING UP WITH RECENT DEVELOPMENTS: Insert the key numbers shown on items in special feature article.

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Company Name _____

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City _____ Zone _____ State _____

August, 1957 **Please send me the following free data**

MAIL POSTAGE PAID CARD FOR MORE DATA

Free Bulletins (Cont'd)

Fire Extinguishers 375
Fyr-Fyter Div., Fyr-Fyter Co. A 40-page illustrated catalog which serves as a buyer's guide for all types of fire extinguishers, hand and wheeled. Besides specifications for each model, data is also given on accessories, hose, breathing apparatus, nozzles, etc. Valuable section also explains NBFU regulations on ratings and location of extinguishers.

SIGNS & WARNINGS

Display Frames 376
Arlington Aluminum Co. This 4-page brochure describes a variety of aluminum display frames of many sizes, suitable as bulletin boards and for safety poster display. Also included are aluminum easels that can be used at safety meetings.

Safety Signals 377
New Castle Battery Mfg. Co. Illustrated bulletin gives data on a portable warning sign on a wheeled standard with two battery-operated warning lights. Unit has a built-in battery charger.

Large Display Signs 378
Wagner Sign Service, Inc. This folder with numerous inserts gives full data on large changeable-copy signs suitable for safety slogans and safety scoreboards either indoors or out. Includes full specifications, typical installations, suitable slogans.

EMERGENCY EQUIPMENT

Centralized Emergency Lighting System 379
Standard Electric Time Co. This 12-page bulletin describes in detail a 32-volt automatic centralized emergency lighting system, approved by UL. Electrically supervised system uses central battery rack with lighting units distributed where necessary.

Hydraulic Rescue Kit 380
H. K. Porter, Inc. Interesting brochure describes a rescue kit that can be used in freeing trapped victims in emergencies. Suitable for rescue squads, fire departments, civil defense, highway patrols, etc., the versatile kit includes a remote control hydraulic jack, spreaders, extension tubes, and many other accessories for moving heavy objects.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	*Subject*
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
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109	Safety Belts
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115	Welding Curtains
	FIRST AID AND PERSONAL HYGIENE
120	Protective Skin Cream
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Athlete's Foot Control
124	Salt Tablets
125	Noise Analysis & Control
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Pressure Bandages
130	Throat Medication
131	Eye Wash Fountains
132	Hearing Tester
133	Disinfectant—Deodorants
	FIRE PROTECTION
141	Safety Cans
142	Drum Safety Valves
143	Safer Solvents
144	Degreasing Machines
146	Fire Blankets

Key Number	*Subject*
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148	Watchmen's Control Systems
	LIGHTING EQUIPMENT
150	Alarms & Warning Lights
154	Emergency Lights
	MAINTENANCE
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161	Anti-Slip Waxes & Finishes
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176A	Fork Truck Fume Muffler
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182	Safety Awards & Emblems
183	Employee Safety Guide
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Safety Maintenance

formerly "SAFETY ENGINEERING"

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AMERICA'S PIONEER MAGAZINE IN ITS FIELD

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it's SAFE to say

• TOMAS, RICARDO Y ENRIQUE

As a one-language nation whose school system soft pedals a second language (by too often relying upon rules of grammar instead of conversation) we are prone to forget that everyone in our midst is not conversant with idiomatic English. Despite the fact that immigration has helped in no small measure to make this country great, many of us become impatient at times with anyone less than a third-generation American.

Years ago, immigration laws provided ease of entry for large numbers of Europeans. Today, however, the emphasis is upon Latin-American countries, particularly our Commonwealth of Puerto Rico whose people are citizens of the United States with every privilege of citizenship enjoyed by lineal descendants of the original Mayflower complement.

In the field of industrial operations, there are vast safety implications in this tremendous influx of Spanish-speaking workers. Not only are our general living and working conditions very different, but the language barrier is a serious one for the Spanish equivalent of Tom, Dick and Harry.

All the safety signs located throughout the plant are just meaningless letters to the average citizen recently arrived from Puerto Rico unless and until he has been given the proper indoctrination. Posters may be of some slight additional help because of the illustrations, but rule books and verbal warnings in English won't lessen the tragedy of "Chico" who doesn't understand "Watch Your Step."

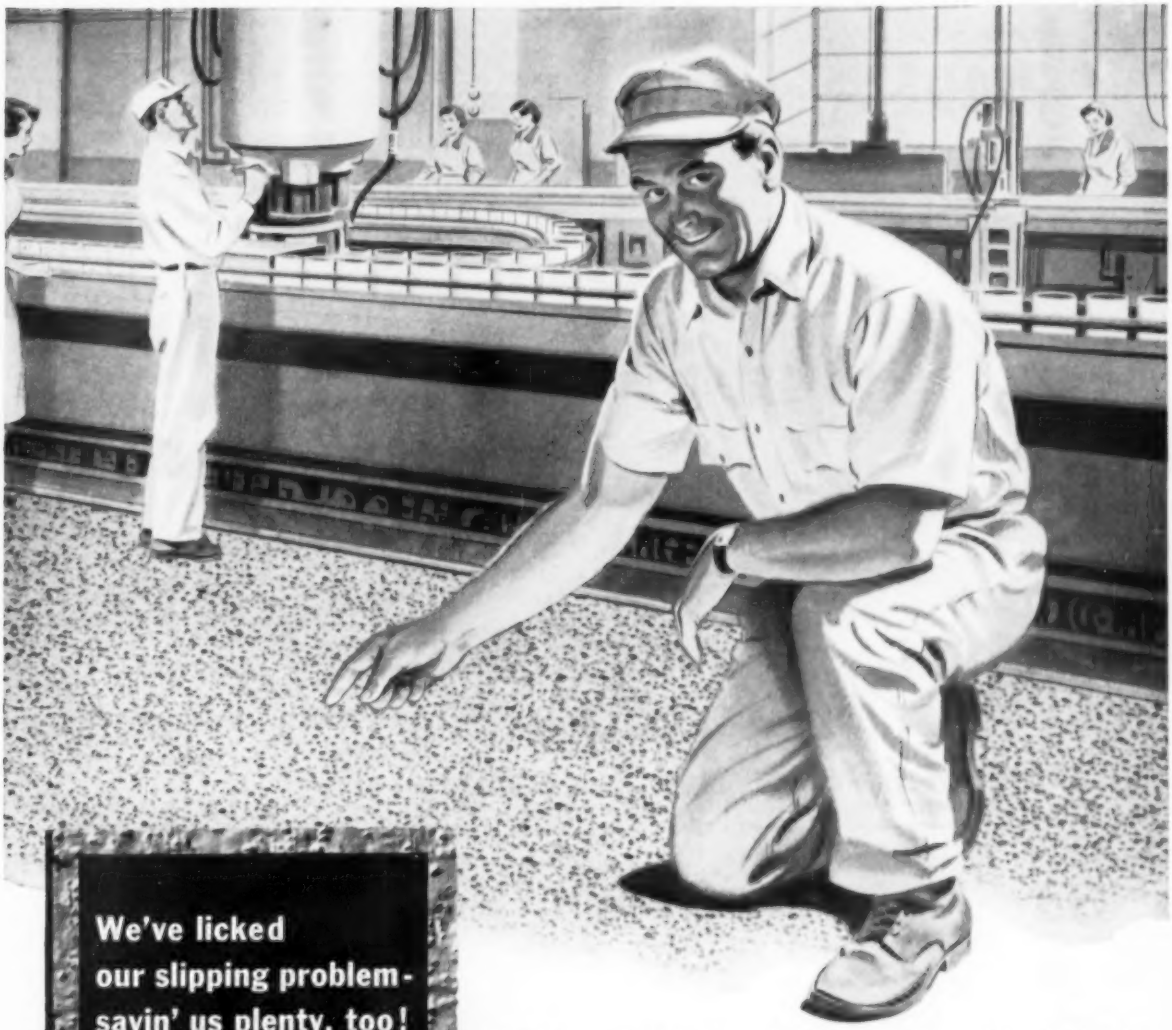
A case in point is dramatically emphasized elsewhere in this issue in an article bearing the title (in Spanish, purposely) "The Misfortune of Chico," written by a well-qualified safety consultant of Latin-American origin. The author reminds us that not only "Chico" but his employer as well suffers because of the lack of safety education in a language the employee can understand. Compensation payments, medical expenses and indirect costs are just as burdensome in the case of Jorge Moreno as they are when the victim is listed as George Brown.

Obviously, the remedy is accent on prevention but in the case of the Spanish (or Hungarian) speaking workman, management has the added responsibility of guidance in a language easily and quickly understood by the employee.

The problem of accident prevention in relation to those unfamiliar with the English language is a matter of proper communication to afford protection against the possibility of injury. Even in our national tongue solution to that problem is a never-ending task.

It must be remembered that in the New York area alone, there are three daily newspapers published in Spanish; many theaters show Spanish films exclusively and there are churches whose services are conducted entirely in that language. Naturally, therefore, others long since have recognized that the need is there and it is becoming greater with every plane-load of workers bound for the mainland of the forty-eight states. Granted that the interior of the country is not confronted with the same situation on so great a scale, nevertheless many non-English speaking men will investigate and gravitate to all parts of the nation to earn their daily bread and broaden the advantages of their families.

When the safety field first became a potent force for good in this country, it was demonstrated that, in industry too, we are very definitely our brother's keeper. This fact becomes no less true whether we are greeted with "buenos días" or "good morning."



We've licked our slipping problem - savin' us plenty, too!

He's talking about ALGRIP—A.W. ALGRIP—the world's only abrasive rolled steel floor plate that provides super-safe footing under the *most hazardous* slipping conditions—on flat *or inclined* surfaces.

ALGRIP licks slipping and skidding hazards thoroughly by providing thousands of abrasive traction particles at every step. It's made by a patented process in which a grinding-wheel type of abrasive is rolled—*not coated*—to a controlled depth as an integral part of tough steel plate. Usage merely exposes more abrasive.

Look around for slipping hazards and make a test installation in your worst area. It'll save you plenty, too, as accident and insurance rates go down. Use it as an overlay or as independent flooring. ALGRIP fabricates easily and requires no maintenance.

ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—approved for safety by Underwriters' Laboratories

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Please send A.W. ALGRIP Booklet ~~AW-222~~

Name_____

Title_____

Company_____

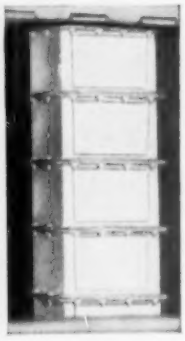
Address_____

City_____ Zone_____ State_____

OTHER PRODUCTS:
A.W. SUPER-DIAMOND economy rolled steel floor plate—Plates—Hot and cold rolled sheet and strip—(Alloy and Special Grades)

Gasoline and LP Gas

EXHAUST FUMES ARE POISON



Stop them quickly, effectively, at low cost with OCM® CATALYTIC EXHAUST PURIFIERS

STOP DEADLY CARBON MONOXIDE. OCM Catalytic Exhausts eliminate 95% or more of CO—90% of harmful, irritating hydrocarbons and other engine exhaust fumes and odors—from any type of equipment burning gasoline *or LP gas.*

INCREASE EMPLOYEE EFFICIENCY AND MORALE. Fume-caused headaches, grogginess, eye irritation, and nausea cost you money—in production slow-downs, lowered work level.

MAKE PRESENT EQUIPMENT MORE PRODUCTIVE. With OCM Exhaust Purifiers, you can run lift trucks, bulk-handling trucks, floor scrubbers, construction machinery, and other equipment continuously, *safely*, efficiently, even in closely confined areas.

EASY TO INSTALL. OCM Exhaust Purifiers can be easily installed on your present equipment without changing clearances. They take the place of the standard muffler. Need little or no maintenance.

LONG LIFE—LOW-COST REPLACEMENT. Up to 2000-2500 hours in normal use—in some cases 4000 and more. Only the catalytic unit needs replacing—simple, economical to do.

STOP DIESEL EXHAUST FUMES. OCM Dieseler controls harmful, irritating exhaust from any *4-cycle diesel* when running at or over 60% load.

OCM Catalytic Exhaust Purifiers are the best way—the *only* way—to good fume elimination, even when using LP gas. Write now for complete information and name of your local representative.

OXY-CATALYST, INC.

WAYNE, PA., U.S.A.

Catalysts for fume and odor elimination, air pollution control, and waste heat recovery

OXY-CATALYST, INC., Wayne 9, Pa.

Please send complete information on:

☐ OCM Exhaust for gasoline and LP engines ☐ OCM Dieseler for 4-cycle diesel engines ☐ Send name of local representative

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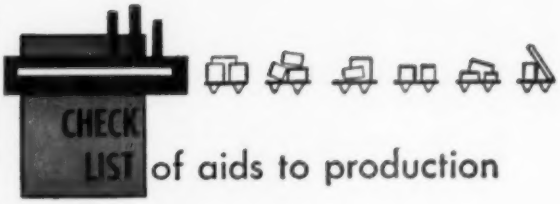

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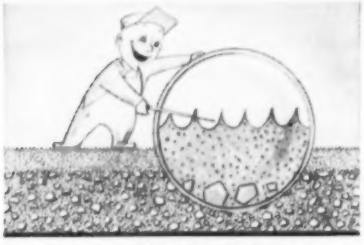
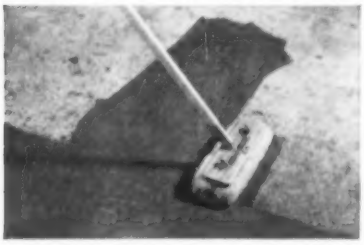
Multi-Clean Concrete HARDENER AND ETCHER is applied with a sprinkling can, then worked into the surface with a broom, brush or Floor Machine.



This is how HARDENER AND ETCHER opens tiny pores to provide "foothold" for sealers. It also cleans, hardens, dustproofs old and new floors.



In "Feeder Strip" Technique, material is deposited liberally in "feeder strip", then spread by operating applicator at right angles across strip.

Low-cost, scientific treatment brings lasting concrete beauty

You'll brighten up the entire area when you transform a drab, dingy concrete floor into an attractive, colorful, easy-to-maintain surface you and your workers can be proud of.

For new or old concrete—The famous MULTI-CLEAN METHOD of floor care is a complete, scientific program for both new and old concrete. It calls for the *right materials*, the *right equipment*, and the *right technique*.

Under the MULTI-CLEAN METHOD your concrete floors are cleaned, hardened, and dustproofed. They are given an attractive finish in a wide choice of clear or 7 non-fading colors . . . *are easy to clean*, and resist abrasion, water, acids, alkalis, grease, oils, soaps, solvents.

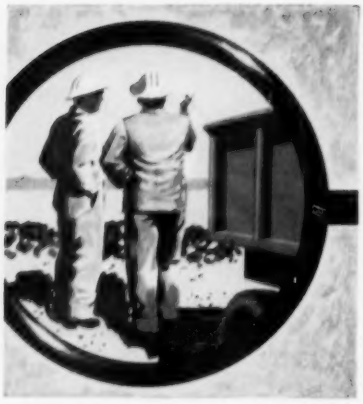
Saves time, money—and besides providing an attractive, long wearing surface, the scientific MULTI-CLEAN METHOD saves many hours of time and many gallons of material.

New folder describes Method—The complete MULTI-CLEAN METHOD for initial treatment of new or old concrete, low-cost maintenance, and restoration of floors which have previously been painted or sealed is described, step-by-step, in a new folder, "The Multi-Clean Method For Maintaining Your Concrete Floors", and by a strip film.

For your copy, or for information on the MULTI-CLEAN METHOD for any other common type floor, call your local MULTI-CLEAN Distributor or write to Multi-Clean Products, Inc., St. Paul 16, Minn. You'll be under no obligation.

ANOTHER PRODUCT OF MULTI-CLEAN RESEARCH

(For details, use Key # G-4 on card on page 1)



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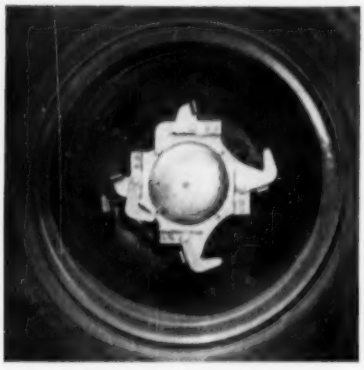

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York Harbor, Me. *September 12–13*

Thirtieth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, Secretary, Department of Labor & Industry, State House, Augusta, Me.

Chicago, Ill. *October 10–12*

Eighth Annual National Noise Abatement Symposium (Sherman Hotel). Guy J. Sanders, Chairman, c/o Armour Research Foundation of Illinois Institute of Technology, 10 W. 35th St., Chicago 16, Ill.

Chicago, Ill. *October 14–16*

Second Annual Sanitation Maintenance Show & Conference (Navy Pier). Orkin Exposition Managements, 19 W. 44th St., New York 36, N. Y.

Chicago, Ill. *October 21–25*

Forty-Fifth National Safety Congress & Exposition (Conrad Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Cleveland, Ohio *November 11–15*

Eighty-Fifth Annual Meeting of the American Public Health Association. Dr. Reginal Atwater, executive director, APHA, 1790 Broadway, New York 19, N. Y.

Chicago, Ill. *January 27–30*

Ninth Annual Plant Maintenance and Engineering Show & Conference (International Amphitheatre). Clapp & Poliak, Inc., Exposition Management, 341 Madison Ave., New York 17, N. Y.

Boston, Mass. *March 17–18*

Thirty-Seventh Annual Massachusetts Safety Conference and Exhibit (Hotel Statler). Bruce Campbell, Manager, Massachusetts Safety Council, 31 State St., Boston 9, Mass.

Ft. Wayne, Ind. *March 18–19*

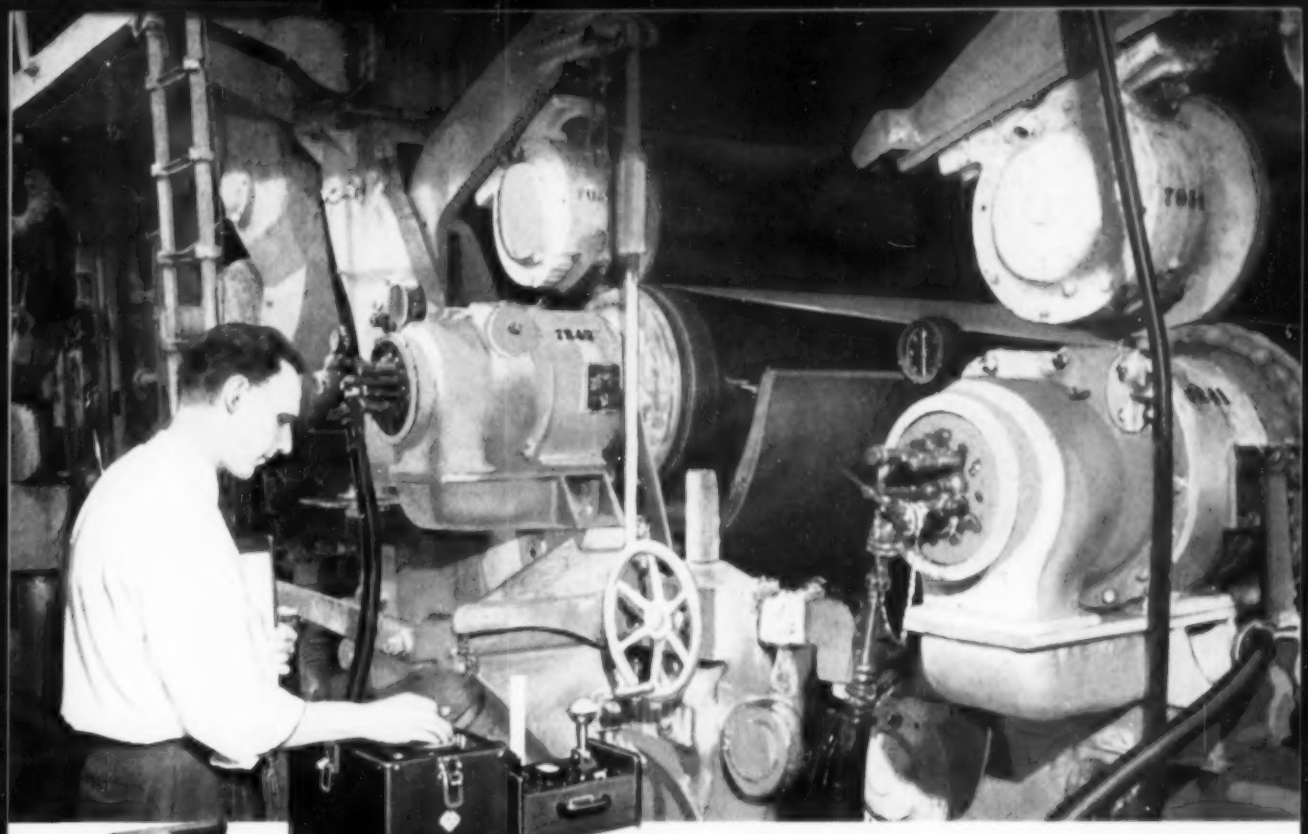
Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager, Safety Council, Chamber of Commerce of Fort Wayne, Ft. Wayne 2, Ind.

New York, N. Y. *April 14–18*

Twenty-Eighth Annual Greater New York Safety Convention and Exposition (Statler Hotel). Greater New York Safety Council, 60 East 42nd St., New York 17, N. Y.

Cleveland, Ohio *June 9–12*

Eighth National Materials Handling Exposition (Public Auditorium). Clapp & Poliak, Exposition Management, 341 Madison Ave., New York 17, N. Y.



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(For details, use Key # G-7 on card on page 11)

Workers from Latin American countries should be taught in their own language how to use safety equipment.

La Desgracia de "Chico"*

by **MARCO A. MARTINEZ**
Safety Consultant

Watch out Chico! . . . the piercing shout broke the monotonous hum-drum of the machinery. All eyes, so busy just a moment ago watching concrete poured in the basement of a building under construction, turned in time to see in horrified silence a huge beam which had been hoisted high into the air strike Chico in the back. For a moment, everyone was frozen in horror till it seemed as though a chain which had been holding them transfixed broke, and several nearby workers ran toward Chico. They saw him lying inert at the bottom of the excavation.

This scene is typical of one that takes place over and over again every day throughout the country, be it in the field of construction, a factory, a hotel, a farm or a ferry. The tragedy is that there is always a Chico who is the victim of tragedy. Why? Because the fact is that Chico,* a Spanish speaking worker, with only a slight smattering of the English language came to this country, probably as a skilled worker, with the same thought as those hundreds of thousands who preceded him—a better job—security for his family and greater opportunity. While he tries to learn new customs, a new language and adapt himself to strange surroundings, in order to earn a living for his family, almost invariably he has had to accept a variety of odd jobs.

During this transitional period, Chico is subject to many more hazards than the older, more established worker, familiar with the language and customs. The primary reason for the additional hazards is lack of proper safety education.

This is a two-fold tragedy in that the businesses and industries who hire Chico are well aware of the high accident rate involved in employing anyone with a minimum of safety education, thereby causing themselves monetary losses due to compensation claims, higher insurance premiums, and a constant turnover of personnel. The second part is—what are these companies doing to prevent further tragedy and improve present conditions?

Some companies with a clear insight into the future coupled with human kindness have taken the initiative and have formed Spanish-English speaking safety courses where the rate of Spanish speaking personnel is large enough to require such a course. In this way they are not only meeting an obligation to a fellow man, but are at the same time protecting their own interests by bringing down to a minimum the current accident rate and ensuing overhead, by raising

*** The title means: "The Misfortune of Chico."**

EDITOR'S NOTE

The author is a well-known figure in the safety movement throughout the Latin-American Republics. He has augmented his personal safety experiences with special courses at the Safety Center of New York University.

* Actually, "Chico" is not a proper name. It has the same connotation as "fellow" or "guy."

the morale and consequently the production.

Chico must be taught safety methods and operations in Spanish as it is a basic principle of pedagogical psychology to teach a person in the language of his birthplace, injecting at the same time proper English words relating to risks and caution, thereby familiarizing him to any danger cries that may arise in his own field of endeavor.

Must Face Problem

Lack of proper safety education is a problem which can no longer be ignored. The fact is that the Spanish speaking population is increasing every day in the United States—especially in the industrial and agricultural fields. In the New York area alone, there are more than one million Spanish speaking peoples. Approximately 70% come from Puerto Rico and the remaining 30% from other Latin American countries and Spain.

Their education, like most other immigrants in general, is dismally low. This is particularly true of the many Puerto Rican workers in the New York City area, the reason for this being that the great majority have come from the interior of Puerto Rico where their only experience has been in agricultural labor. This same condition applies to the Mexican "braceros" in the western states and the "Harvest Collectors" who come en masse to Florida from Puerto Rico for temporary work. Here too, the accident rate is high and the saddening fact is that nothing has been done yet, nor are there any indications that the near future holds plans to correct this situation.

Step Toward Solution

The first step toward the solution of this problem is the education of the workers involved. In order to succeed, however, it will be necessary to understand the basic traits of the people we are considering. Their background, emotions, reactions, desires, and motivations. It is not possible to deal with two basically different individuals by using the same methods and techniques. It is not so simple a problem as merely assuming that one is an inferior race and the other a superior one. We are dealing simply with two different types of individuals and therefore all educational efforts must be channeled in a way that will bear practical results.

A typical inherent characteristic of the Spanish speaking population, and one in which they take a great deal of pride, is their individuality, a high degree of family honor, sense of duty and bravery.

Easily Observed

In countries where a large Indian population is mixed with Spanish descendents a strong strain of individuality is produced with a great disregard for life, due to the values inherited from the pre-Colombian races of pagan worshippers accustomed to the offering of human sacrifices.

In other countries, where the Negro strain is also part of the population the predominant characteristics of the varied African tribes are easily observed.

In summation, the safety problems among Spanish speaking workers living in this country must be coped with now. If it is considered important enough to place "Se Habla Español" in the windows of our leading stores in order to solicit their trade, then surely it becomes imperative to offer them safety educational facilities that may not only afford industries the opportunity to meet greater competition, but will unquestionably save lives and limbs.

Here's a striking example of how heavy duty portable vacuum cleaners serve the needs of many diverse industries. At Republic Aviation in Farmingdale, Long Island, vacuum cleaners are used on F-84F Thunderstreak jet fighter-bombers to remove any stray nuts, bolts, rivets, or pieces of metal which may have fallen into fuselages or wing sections during construction. Failure to take such precautions, the company emphasizes, could have disastrous results. A stray bolt, for example, might work its way into the air-intake duct and be sucked into the engine, damaging some of the turbine blades, and causing the plane to flame-out in flight.

Picture by courtesy of Spencer Turbine Co.

RLM News Letter

A new RLM service for those interested in industrial lighting standards and developments concerning them is announced by the RLM Standards Institute, Inc., 326 W. Madison Street, Chicago, Ill., a non-profit corporation with 28 leading lighting equipment manufacturers participating in the Institute's program. Issued under the direction of the Technical Committee of the RLM Standards Institute, headed by Charles L. Amick, the Institute will publish periodically a news letter covering news of developments in standards, new specification announcements, progress reports, etc. The number one issue now being released to architects, consulting engineers, electrical contractors, electrical distributors, lighting specialists, etc. covers such items as the forthcoming RLM specification covering fluorescent lighting units for the 800 milliampere lamps and the recommendations for increase in the efficiency of light output on the SD-1 units. It is the intention of the Institute to place on the complimentary list all those who may be interested in the specification, installation or purchase of industrial lighting equipment. Requests for the Number One issue and for enrollment on the complimentary subscription list should be sent to the Editor, RLM Industrial Lighting News, Suite 818, 326 W. Madison Street, Chicago 6, Ill.

TIPS ON SHAPER SAFETY

Operation view of modern single-spindle shaper set up for lipping cabinet doors. The fence and holddown have been arranged so the spring arms which support the holddown block pass through openings in the fence. In this way, it is practically impossible for a man to get his fingers in the cutters.

Woodworking machinery has always been considered particularly dangerous because it is **highspeed** machinery. It is true that higher speeds of woodworking machines make them more dangerous in some respects. Nevertheless, this idea is at least partly erroneous in the case of the hand feed wood shaper. Actually, higher-speed shaper spindles used today are much safer for any operator than those on older and slower-speed units.

Other things being equal, when a piece of material is advanced into the cut, and during the time it is being machined, knife edges on the fast-revolving shaper spindle obtain very tiny bites; they cut away such small amounts that there is little danger of material kicking back. This is not to say that such an accident cannot still happen, or that it does not sometimes take place, but it is much less liable to occur on a modern highspeed shaper.

Highspeed shaper spindles were a little difficult for some operators of the old school to use advantageously, until they became accustomed to differences in practice necessarily imposed by higher speed. This is especially true in regard to using relatively heavy knives, or using a pair of knives not precisely alike in weight, which do not quite balance each other.

On an old-time shaper with a relatively heavy spindle, which ran 4500 rpm or less (usually less), much heavier knives could be swung safely, and much greater departure from perfect balance between the two cutters could be tolerated. This was true because of the relationship between rotary speed and centrifugal force. Simply stated, centrifugal force varies not as the speed, but as the **square** of the speed. Therefore, if the rotary speed of a shaper spindle is doubled, centrifugal force has been quadrupled.

Requires Better Balance

It follows that the high speed employed in the relatively light shaper spindles today requires that collars and other revolving components be balanced with much greater nicety. Any pair of knives used together must also be exactly the same in dead weight, or as nearly so as possible.

Short workpieces are exceptionally dangerous to handle at woodworking machines of most types; this is true at the hand feed shaper. In some instances where short material being processed will allow doing so, it is customary to get out the pieces in multiple lengths. This gives a shaper operator the benefit of obtaining a far better hold on the workpieces, controlling them with much greater ease. In various instances, after first shaping along an edge of a piece gotten out in multiple length, the final pieces can be separated by sawing. This eliminates the danger that would otherwise be involved. However, there are certain instances where short pieces must inevitably be handled at the shaper.

Where there is no reasonable means of escape from handling and machining short pieces of stock at the hand feed wood shaper, arrangements can often be made for clamping or otherwise fastening such pieces to a larger piece, either singly or in multiple, until necessary shaping has been accomplished. Another way of providing good control on a single, relatively-small workpiece on the shaper table is to hold it in a standard handscrew. This is done in such

(Continued on page 27)

DOES SAFETY PAY OFF?

The vision with which man has been blessed is manifested by the progress of civilization. First must come the dream of giant structures, tunnels bored through mountainsides and under rivers, harbors dredged and deepened for the commerce of the world—all in the sublime hope that communication between free peoples will ease, if not end, the tensions of mankind.

But with vision there must come responsibility. Mother nature is a rugged task-mistress who bows grudgingly. Many times she claims lives before giving up the battle. Because of this, safety plays an indispensable part in the drama of men and machines. Loss prevention programs and preventive medicine are the armor in man's constant struggle for accomplishment.

To honor the Port of New York Authority for establishing a safety record "unmatched in tunnel construction history", officials of the Port Authority and members of the insurance-medical-safety team that completed the complex and dangerous task without a single fatality under air pressure, a luncheon was held in New York recently to celebrate the completion of the Third Tube of the Lincoln Tunnel built under the Hudson River. Completion of the Port Authority's hundred-million-dollar Third Tube has added still another link between metropolitan New York and New Jersey and thus another useful symbol of man's triumph over nature.

In an elaborate ceremony, Indemnity Insurance Company of North America, underwriters of the huge construction job paid tribute to those achieving one of the most outstanding safety records of all time.

Herbert P. Stellwagen, executive vice president of the insurance company, presented to the Port Authority a replica of the silver pen and ink stand used to sign the Declaration of Independence.

Individuals honored received Certificates of Commendation. The citations emphasized that through their efforts" the Third Tube shall live as an inspiration to industry—a monument to human dignity in man's eternal struggle for accomplishment."

Accepting the pen and ink stand on behalf of the Board of Commissioners of The Port of New York Authority, chairman Donald V. Lowe said, "The gratifying success of the Third Tube safety program is a direct result of the combined efforts of contractors, unions, the insurance company and the Port Authority—an example of men working together to achieve a common purpose. It is people who make safety a living program."

New Jersey approaches to the Lincoln Tunnel. New third tube at right.

Here's An ACTUAL Safety Bonus

Two of the checks, totaling over $1 million, paid BECAUSE of safety.

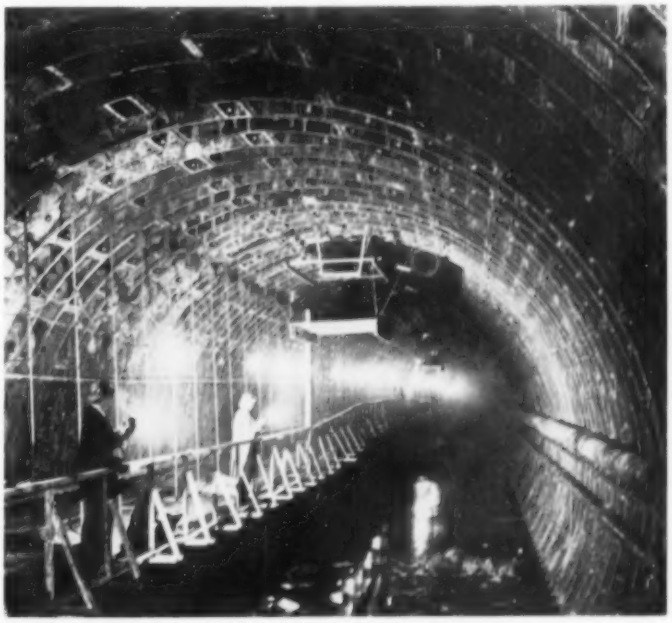
Mr. Stellwagen announced that "the Port Authority has earned the gratitute of every person involved in this great engineering project. It is one more demonstration of the Authority's abiding concern for human values and the general welfare."

He referred to the "unique workmen's compensation policy which the Port Authority had negotiated with the Indemnity Company covering the insurance required by law of all the contractors on the job. Thus far," he said, "the Port Authority has earned a return premium of $1,306,506 under this policy because of the remarkable success of the safety program."

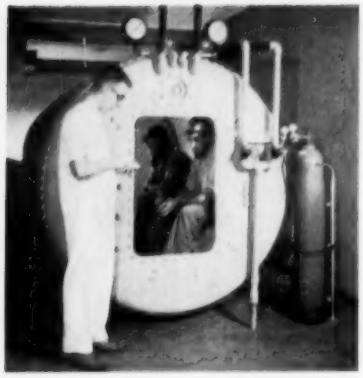
The Shield Method

The Third Tube was driven beneath the Hudson River by the shield method. A 55-foot vertical shaft was excavated in solid rock and a prefabricated steel tunnel shield was erected at the base of the shaft. A rock drift was blasted toward the river and the shield was pushed into this drift.

The Shield: The steel shield is a horizontal cylinder, 18 feet 4 inches long and 31 feet 8 inches in diameter, resembling a glass tumbler laid on its side. It is composed of a steel plate outer lining and a series of horizontal and vertical steel members. Attached to the front face of this framework are a series of steel plate bulkheads with trap doors which can be opened to admit rock and earth into the tunnel. On the forward edge of the outer circumference of the shield are cast steel cutting edges. Inside and to the rear of the shield are 28 giant hydraulic jacks, having a thrust of 200 tons each. It is these gigantic jacks which drove the hugh steel shield forward on the 5,486-foot trip under the Hudson to New York. The initial push was made against ten tunnel rings temporarily assembled



30,000 cast iron and steel segments weighing 48,000 tons make up 2,031 rings in the under-river shell of the third tube of the Lincoln Tunnel.



Two-section decompression chamber for testing and treating "Sand Hogs" for compressed air illness is part of medical clinic provided by the Port of New York Authority. Front section of chamber is used for testing the ability of men to work under compressed air; rear section for treatment of compressed air illness, which requires recompression to at least twice the pressure under which the men have been working underground.

Personal protective equipment such as goggles and hard hats cut injuries.

in front of a thirty-inch-thick concrete wall at the base of the shaft.

Rock in front of the shield was blasted and drawn into the tunnel for removal up through the shaft. As the way was cleared, the shield was pushed toward the river. A cast iron ring section which forms the permanent outer sheathing of the tunnel was then erected inside the rear of the shield. Each ring has an outer diameter of 31 feet, is 32 inches wide, and is made up of 14 segments of seven-foot length and a small key or locking segment. High tensile steel bolts hold the rings together. To erect a ring, the segments are thrust into place by a mechanically operated erector arm, which is attached to the rear of the shield framework and pivots about the center of the tunnel diameter. Mechanical tighteners bolt the segments together.

After a ring was installed, the shield was pushed ahead 32 inches by means of the hydraulic jacks braced against the face of the previously assembled cast iron ring. Another ring section was then installed, bolted in place and another forward shove made. After the shield had progressed about 60 feet from the shaft a ten-foot-thick concrete bulkhead was erected behind the shield within the cast iron lining and compressed air was induced into the working space between the shield and the bulkhead. The bulkhead was pierced by three air chambers so that men and materials could enter or leave the working chamber without loss of air pressure.

As the shield moved toward the river it emerged from the rock and entered the soft, silty material which underlies the Hudson River and the adjacent shoreline. This material is semi-fluid creating an external pressure which must be offset by compressed air. It is under these conditions that the "sand hogs" came into their own. They closed all but two or three of the trap doors in the front of the shield, allowing controlled amounts of silt to ooze into the tunnel. This silt was deposited along the bottom of the tunnel and its weight tended to offset the buoyancy of the incompleted tunnel.

The sand hogs continued assembling the rings at the rear of the shield and pushed or shoved the shield ahead. While progress in the rock was limited to one or two rings a day, the movement through the soft river silt reached as high as 13 rings or 35 feet in a single day. The tunneling went on twenty-four hours a day with a steady stream of men and materials on mine cars being locked into or out of the working chamber. About 200 sand hogs were employed in this operation.

Even before the plans for still another tunnel under the Hudson reached the drafting board stage, Port Authority engineers knew that they would be faced with serious problems resulting from the use of compressed air in tunneling operations under the river bottom. The soft silt which composes the Hudson River bed and the proximity of existing tunnels would make it necessary to use the shield method of tunnel construction. This method of shoving a hole under the river bottom ooze, with sand hogs working in compressed air to block out silt and river water can present almost indescribable hazards.

Architects of the Third Tube medical-safety program were John M. Kyle, Chief Engineer, Dr. Samuel I. Kooperstein, Medical Director, and Vincent W. Mooney, Safety Engineer, all of the Port Authority. These men, working in cooperation with J. Stanley Rosen, the broker's safety engineer, and with safety specialists of the insurance company, compiled a record of loss and accident prevention unmatched in tunnel construction history. It is through their efforts that the Third Tube was driven under the Hudson without a single

Four "Sand Hogs" tightening ring section bolts.

243–Q

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fatality occurring in compressed air, the most hazardous phase of subaqueous tunneling.

Actual driving of the 240-ton shield was begun from the Jersey side on November 9, 1954, and reached the New York shaft on June 28, 1956. A force of 200 men worked four shifts around-the-clock, six days a week for 20 months, facing innumerable perils.

"The key to the success of any safety program," Mr. Kyle emphasized, "is to develop in each worker a sincere interest in working safely." Among many steps in accomplishing this the Port Authority installed promotional safety posters at key locations and developed a large-scale outdoor sign program for display of safety material. Personal participation among workers was encouraged by holding safety slogan contests. Each worker also received an illustrated booklet on tunnel safety pointing out the safe method of doing a job.

Safety meetings were held to permit an exchange of ideas between supervisors and the men on the job in an effort to find methods of improving the safety program. The unions cooperated by appointing four stewards as safety coordinators. Contractors allowed time for employee safety meetings and for a monthly meeting of the safety coordinators, Mr. Mooney, Mr. Rosen and insurance company safety engineers.

Before sand hogs began driving the tunnel shield on its 5,486-foot journey through Hudson River silt, the Port Authority constructed a highly specialized medical clinic on the New Jersey side of the river. The clinic, set up and directed by Dr. Kooperstein, was the most comprehensive medical facility ever provided at a compressed air job site in the New York area. The medical and safety program, provided for sand hogs and other workers, cost about $200,000.

The single story frame structure housing the "miniature hospital" was 55 feet by 60 feet, containing 3,300 square feet of floor space, divided into 12 rooms. In addition to the decompression chamber, facilities included a physiotherapy room, audiometer room, X-ray equipment, surgery and examination room, a laboratory and office and administrative space.

The decompression chamber in the medical clinic is a cylindrical steel lock, 18½ feet long with a diameter of six feet. As many as eight men seated on benches on either side of the front lock in the two-section chamber can be tested for compressed air work. A glass "bull's eye" above the chamber door permits a medical attendant to observe reactions while pressures ranging from five to 15 pounds above atmospheric pressure are supplied. Each man is instructed to signal at the first sign of distress so that the pressure may be immediately lowered to provide relief.

Emergency Measures

To facilitate emergency decompression chamber use, every sand hog wore a numbered badge at all times stating that he was a compressed air worker. This badge bore the address and telephone number of the Third Tube medical lock and carried instructions that in case of emergency anywhere of an unknown or doubtful cause, the wearer should be rushed to the medical lock rather than to a hospital.

The medical clinic was manned around-the-clock, six days a week. A staff of four physicians and three nurses, in addition to medical technicians, was under the direction of Dr. Kooperstein. One of the four doctors was on emergency decompression chamber call Sundays and holidays.

In addition to training under Dr. Kooperstein, physicians were instructed in the theory and practice of handling compressed air illnesses by Captain Gerald J. Duffner, U. S. Navy Medical Corps, a recognized authority who was retained by the insurance company as a consultant.

While the medical clinic was available for the treatment of compressed air illness or other sickness, its primary objective was prevention. For this reason, rigid pre-employment examinations given to sand hogs included the recording of a detailed medical history, physical examinations including laboratory tests, electrocardiograms, audiometer (hearing) tests, breathing tests, and a test in the decompression chamber to determine if the worker's ears could equalize under pressure. Pre-employment X-rays were also available for workers.

Statistics compiled on the prevention and treatment of compressed air illness will constitute the first such medical record at a compressed air construction job in this country. The clinic, operated exclusively by the Port Authority for men on the job, was good psychology. Workers even reported minor accidents or illnesses. Through such encouragement and cooperation, the clinic prevented aggravation of minor injuries by treating them immediately.

Responsibility for making safety a "living" program belongs to Vincent Mooney. Sand hogs are a rugged, courageous group, well suited to the risky business of tunneling. Danger is part of their lives. It was Mr. Mooney's job to show them how to face these dangers in the safest possible way, to create an awareness of all hazards. The first two tubes of the Lincoln Tunnel claimed seven lives. Safety teamwork inspired by the Port Authority's program made certain that no such record was compiled on the Third Tube.

The safety campaign went much further than just paying lip service to signs and slogans. Mr. Mooney made it a working program by setting up a system of safety supervision with unions, management and workers. Right on down the line, from union presidents to business agents, delegates, foremen and supervisors to shop stewards, everyone knew that safety received top priority. Recommendations on how to make various jobs safer came from all quarters, were continually discussed and carried out.

Indemnity's safety engineers worked closely with Port Authority personnel, assisting in the over-all program. A specialist in construction safety of the insurance company was on the job site daily with an eye towards loss prevention and to confer with Mr. Mooney and others, reporting unsafe conditions for follow-through, and analyzing accident causes and remedial measures.

Through the efforts of Safety Engineer Mooney, Dr. Kooperstein, general tunnel contractors Mason-Johnson-MacLean, and the men working with them, the Third Tube medical-safety program paid off in savings of human lives as well as dollars.

A new employee gave us the idea...

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SAFETY MAINTENANCE

by **JACK HAWLEY**, President,
Management Control Systems, Inc.
Washington, D. C.

EXPENDABLE TOOLS

their Maintenance and Control

In order to provide for sound application of an effective system of maintenance, the tool crib attendant or attendants must have the necessary equipment to carry out routine maintenance tasks as well as to make certain minor repairs.

The available equipment for tool maintenance should permit the performance of a variety of simple operations, such as sharpening cutting tools, refacing grinding wheels, and so on. In addition, it should be possible for the tool attendant to make simple repairs to dies and small power hand tools, and to perform the host of similar maintenance and repair operations which do not require heavy or special equipment.

The tool maintenance equipment which is installed in the tool crib should also be equipped with the jigs and fixtures which make possible automatic positioning of tools for accurate maintenance work. Holders should be provided for the positioning of cutting tools so that the required angles and clearances will be obtained automatically.

It is obvious that such jigs and fixtures will make for faster and more efficient performance of tool maintenance operations. However, it is also important to note that their use will have a direct and substantial bearing on tool life. It has been demonstrated conclusively that careful maintenance of tools under the controlled conditions provided by these jigs and fixtures can increase tool life by as much as 100 percent over hand maintenance methods. This is particularly true in the case of cutting tools.

Cleanliness of the tool crib was previously mentioned as a major consideration in the maintenance and preservation of tools. The importance of this requirement makes it desirable to maintain a small hand vacuum cleaner for use in the tool crib. The cleaner is excellent for removing dust and dirt from tool locations where other types of cleaning are impractical.

Inevitably, there will be repair jobs which are beyond the capabilities of the tool-crib attendant or which exceed the limitations of the maintenance and repair equipment available to him. When such a repair is required, identifying data about the tool and the repair to be made should be carefully recorded as an important item of tool-crib inventory data. In the case of most smaller manufacturers, inability of the tool-crib attendant to make the repair will mean that the repair cannot be made within the plant. Where this is true, the broken or damaged tool will, of course, be sent to a qualified toolmaker for repair.

Expendable Tool Charge-Out

It is necessary to establish methods and procedures for issuing tools, a tool charge-out system, and the tool-crib records which these functions involve.

Tool loan or charge-out is the initial step in the cycle through which the tool crib serves the production effort. As such, it is the logical starting point for an examination of the methods of accounting for expendable tools. Such control, which can be found in any well-planned system for the maintenance and preservation of expendable tools, will start with an adequate and accurate method of charge-out. There are, generally speaking, two such methods in use today.

THE CHECK SYSTEM: This system, which was practically in universal use just a few years ago, features the use of a brass or plastic check or tag as the medium of exchange between the production worker and the tool crib.

This check carries the individual employee's identification stamped upon it, usually his clock or employee number. When the employee withdraws a tool, he surrenders his check for it and the check is placed in the position from which the tool was removed. When the tool is returned, the employee receives his check back from the tool-crib attendant. Sometimes, rather than identifying the employee, the check carries a number which identifies the production job on which the tool is to be used. In either case, the system provides information as to the current location of the tool but provides little else.

For example, the system offers nothing in the way of an accounting medium; the maintenance of some additional type of record is necessary if an accounting is to be made of the use of the tools. In spite of this disadvantage, however, the system is still in use in many shops.

THE CHARGE-OUT SLIP SYSTEM: On the other hand, those organizations which studied the potential economies resulting from a well-planned expendable tool accounting system have adopted a method which goes far beyond that of merely assuring return of the tool to the tool crib. The results have been so rewarding that the systems, even when started with "tongue-in-cheek" acceptance, have gained ever-increasing interest and support from management. These systems are based upon the use of charge-out slips in place of the brass or plastic checks.

Charge-out slips for the withdrawal of expendable tools from the tool crib are usually multiple-copy forms. The complete form consists of an original and one copy

since this is normally sufficient to satisfy all phases of control. Refinements in statistical analysis of tool usage or a requirement for additional information copies can add one or more copies to the pack. For pure control purposes, however, an original and one copy should be enough. Where a greater number of copies is required, the reverse side of all but the last copy

This is the second part of an article on expendable tools. The first part, which was published in the July issue of SAFETY MAINTENANCE, outlined the need for a tool control plan, the location of tool cribs and the selection of tool crib attendants.

of the form carries spot carbon, automatically transferring to the other copies those entries made on the original.

The charge-out slip should be so designed as to guarantee that it will meet all requirements of the individual shop. As a minimum, however, it should always include the information given in Table A on page 22.

In the case of production shops which require preparation of production operation sheets for each production unit in advance of the scheduled starting date of the job, the charge-out slips are normally prepared at the same time the operation instructions are written. These slips are forwarded to the tool crib, where the tools are picked and segregated in advance for delivery to the workmen on the date that production is scheduled to begin. The signatures of the individual workmen are obtained at the time the tools are delivered. Once these tools have been issued to the workmen, they are retained by them until completion of the production cycle. Of course, if a tool is damaged or needs sharpening or repair, it is returned to the tool crib for the necessary work and replaced by another tool of the same type and size.

In shops doing job work, experimental manufacture, or short-run production operations, tools are withdrawn frequently and are retained for relatively short periods. The workers withdraw the tools as needed, preparing a charge-out slip for each tool required. The charge-out slips should be available in a handy receptacle at or near the tool-crib issue window and a shelf-type writing surface should be provided for the convenience of the workman who will be listing his tool requirements there. Upon presentation of the charge-out slip to the tool-crib attendant, the tool is located and issued to the workman.

The tool-crib attendant separates the original of the charge-out slip from its duplicate copy and files it by the employee's identification number. The duplicate copy may be placed on a hook or in a clamp at the location from which the tool was removed. If a bin storage system is being used, the copy may be placed with the record showing the tool's location in the bin, if the physical size of this record is sufficient to allow it. In either case, the duplicate copy is, at this point, performing the same function as the brass or plastic check. It is serving as a notice that the tool has been issued and, further, it identifies the individual to whom it was issued.

The fact that the charge-out slip is dated at the time of issue tends to prevent a worker's retaining a new or favored tool after the immediate need for it has been satisfied—a practice which not only deprives other workers of the use of the tool, but also requires maintenance of an excessive inventory to satisfy workers' needs.

When the workman returns a tool, the original of the charge-out slip is removed from the employee file, the date of return indicated and initialed by the workman, and the slip then placed with the returned tool pending inspection of the tool. If this inspection shows that the tool is in satisfactory condition and can be reissued, it is returned to the bin from which it was drawn. The duplicate copy of the charge-out slip is then destroyed, unless some other record will be served by its retention. The original of the charge-out slip is placed in a file by tool number. Thus all slips relating to the same tools are kept together for purposes of future statistical accounting.

In some plants a slight variation of the foregoing, as outlined in the following paragraph, will be more suitable.

When the workman returns the tool, the original of the charge-out slip is returned to him and the duplicate is placed with the returned tool pending an inspection of the tool prior to its return to the bin from which it was drawn. If this inspection shows that the tool is in satisfactory condition and can be reissued, it is returned to its bin and the duplicate of the charge-out slip is placed in a file by tool number, thus putting it with other slips carrying the same tool number for purposes of future statistical accounting.

The simple procedure outlined above will cover the majority of transactions. However, in those cases in which the tool was broken or damaged during its period of use, there is a variation in the procedure.

If a tool is broken or damaged while in the possession of a workman, he should be held responsible for reporting that fact to the tool-crib attendant at the time he returns the tool. For this purpose a damaged tool report should be used which is similar in design to the charge-out slip.

In addition to identifying the workman and department returning the tool as well as showing the tool identification number and description, this form should provide space for an explanation of the damage and reason for it. Further, space should be available for a notation as to the disposition of the tool, such as scrap, salvage, or repair.

The foreman of the department in which the tool was used and damaged should be responsible for determining the cause of damage —whether it was due to carelessness or neglect on the part of the workman or else was unavoidable due to the nature of the operation or the design of the tool. The workman should place his signature on the damaged tool report before returning the tool to the tool crib. When the tool and damaged tool report are received, they should be put to one side until time permits a complete inspection of the tool to determine what disposition should be made of it.

Occasionally a broken or damaged tool will be turned in without a damaged tool report. However, the regular inspection of a returned tool prior to its replacement in the storage bin should reveal that the tool has been damaged and the tool-crib attendant should then fill out a damaged tool report. After recording as much of the required information as may be available to him, he can send the damaged tool report back to the foreman of the department in question for verification and, in addition, an explanation of the cause of the damage.

As in the case of the charge-out slip, the duplicate copy of the damaged tool report is primarily for use as a control copy. Once the facts of the damage have been collected and the cost of any repairs posted to the original of the damaged tool report, the copy may be

TABLE A: DATA ON CHARGE-OUT SLIPS

(1) The employee's identification, usually by means of a number;

(2) The tool's identification, also by means of a number, as an essential to speedy statistical sorting. The number should be based upon a classification system which will provide positive identification of the class, size, and other limitations of the tool;

(3) Date upon which the tool is issued;

(4) Quantity in which the tool is issued;

(5) Alphabetical name of tool, its size and other limitations;

(6) Signature of the workman withdrawing the tool.

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destroyed unless its retention will serve some other record-keeping purpose. Just as the original or duplicate of the charge-out slip was filed by tool identification number for future statistical accounting purposes, the original of the damaged tool report is also filed by the same number for the same use.

The charge-out slips and the damaged tool reports should be analyzed on a periodic basis. The interval between analyses should be based upon usage of the tools. It is the total number of pieces of paper which will determine the size of the job of analysis.

This analysis will provide a picture of the usage of each tool for the period covered and, when compared with usage data for preceding periods, will also indicate whether the usage is increasing or decreasing. Damaged tool reports will provide information for the adjustment of inventory as well as data on repair costs, losses, and value of scrap accumulated, due to damaged tools. In addition to this statistical information, which is useful for the expendable tool record-keeping function, the data on causes of tool damage can point the way to corrective measures and thus serve to reduce the amount of future damage.

This is all very valuable and worthwhile information, but it must be collected at some central point if its maximum potential is to be realized. That point is the perpetual inventory record of expendable tools.

The perpetual inventory record for expendable tools should be maintained by means of one of the many excellent commercial systems available to the small manufacturer. No attempt will be made here to describe such a record in detail. However, certain basic features of any well-conceived plan of inventory control for expendable tools should be pointed out.

First of all, the record should contain a card for each class of tool and for each type, kind, or size of tool within that class. In addition to the description of the tool which is used as the "title" of the card, the card should include information as to the aisle, shelf, and bin number where the tool is stored, sources of supply, cost, usage rate (turnover), and so on. The record is established through a physical inventory count. Thereafter it should show increases through purchase, salvage of similar tools to meet the specifications of the tool in question, and additions from any other sources. By the same token it should show decreases through loss, breakage, scrap, or any other withdrawal process. Since the inventory control record is maintained in the tool crib, it is a ready source of reference as to the location of tools as well as a possible physical location for the filing of original charge-out slips and damaged tool reports.

Material by courtesy of the Small Business Administration. Picture by courtesy of General Electric Co.

MAKE

Satisfactory maintenance in the modern industrial plant presents an increasingly important problem under today's strenuous production conditions. If production is to meet demand, every part of a plant from front office to shipping department must be maintained in 100% safe performance condition at all times. And one essential of safe plant maintenance is the painting of walls, floors, ceilings, machinery, and equipment essential to steady production.

Time was when most plant managers considered a new coat of paint all that was necessary for a complete maintenance job. The type of paint and the color were usually selected with little thought as to the surface and atmospheric conditions, suitability of color, or any of the variable factors which enter into every painting job.

In practically every level of industrial and commercial life, there is a growing understanding of the fact that there is more to color than meets the eye according to paint experts of Pittsburgh Plate Glass Company. As a result, painting is no longer being done merely for decoration and protection. Today, painting is being done with colors that are purposefully chosen for their ability to increase productive efficiency, create a cheerful environment that improves morale, reduce absenteeism, and lessen the dangers of costly lost-time accidents.

In the past years, industry has expended a great amount of time and effort in promoting the physical welfare of employees through research into the problems of better working conditions. However, little thought was given to the use of the power of color in avoiding eye fatigue until the introduction of the idea of color dynamics. This scientific application of color utilizes the inherent energy in color and makes it possible to select and apply correct colors for all paintable areas in factory or shop, whether they are on the machines themselves or their background of walls, ceilings, and floors. This may be done with little or no cost above that of the usual painting and maintenance work done in a progressive industrial plant.

Color dynamics can make a real contribution toward the attainment of each of the four objectives shown in Table I. The fact that the system makes possible a happier and more comfortable worker due to the lack of eye fatigue and a feeling of safety is reflected in the increased quantity and quality of production. As a result, both labor and management benefit.

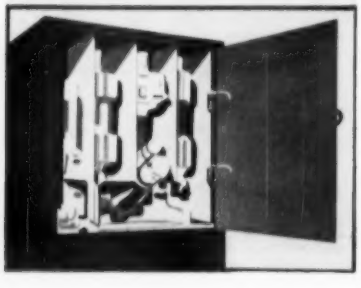
Color Promotes Safety

One of the more important results of industrial color has been in the field of safety. This includes use of its symbolic power for direct identification purposes and its psychological power for effect on employees. The practice of applying color on machinery to identify controls, switches and levers brings these essential operating points well within the visual range of the employee so that controls are readily identifiable in case of emergency. The symbolism of color has also been used to mark piping and for other stationary equipment and apparatus.

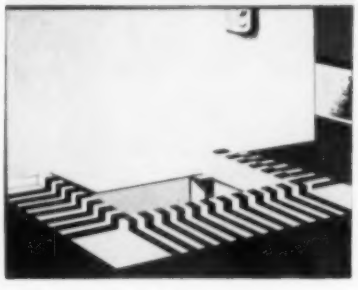
Several colors have been used for marking mobile equipment such as motor trucks, traffic aisles, storage bins, conveyors and cranes. Of these, focal yellow is the most satisfactory. In some instances, the surface of the equipment is painted focal yellow, which has high visibility, and diagonal black strips are used for emphasis. This same color scheme proves effective for marking any projections in the factory—the edges of shipping or other platforms, steps, and other points constituting a safety hazard.

Engineered color has been the direct reason for influencing employees to adopt good housekeeping practices. Cheerful color tends to engender in the employee a sense of pride in his surroundings and his work with the result that he is more eager to keep his area clean and tidy. Orderliness is a cardinal safety consideration and any factor which can induce workers to change from slipshod practices goes far in helping reduce the over-all accident

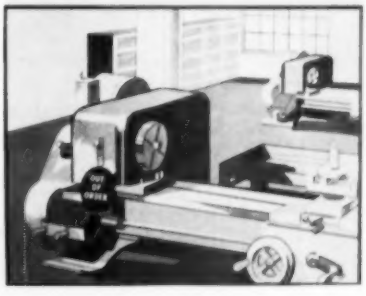
ORANGE
THE ON-GUARD COLOR



YELLOW
THE WARNING COLOR



BLUE
THE CAUTION COLOR



WITH

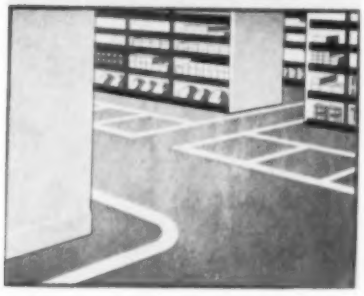
SAFETY DYNAMIC

rate. In this matter of good housekeeping, many plants have included in their color patterns the painting of waste receptacles in focal colors and placing them in areas where a white or light colored background makes them attention factors. Such practices have proven very effective.

Less Absenteeism

Drab and cheerless surroundings are conducive to mental depression on the part of the industrial worker. Improper lighting is usually present

WHITE
ZONE MARKING COLOR

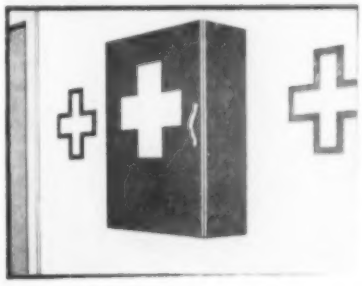


under such conditions and this leads to eyestrain with its accompanying nervous tension and fatigue. All of this makes the effort necessary to do a given piece of work much greater. It accounts for a great deal of lost time both through outright absence or time wasted on the job. These unfavorable working conditions which account so largely for absenteeism can be eliminated by following closely the principles of color dynamics.

In essence, the scientific use of color is based upon principles somewhat similar to camouflage, but diametrically opposed in application. In color dynamics, the first job of color on machinery and equipment is to separate the critical from the non-critical parts and visually to divorce the critical parts from the material worked upon.

To do this the critical or operating parts are painted with a color that comes quickly to the eye—a

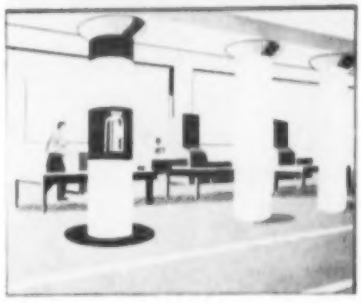
GREEN
THE FIRST-AID COLOR



color that "moves" in strong contrast to the stationary or non-critical parts of the machine. These vivid colors are known as focal colors. Their primary function is, in combination with contrasting colors, to focus the worker's attention exactly where it should be, on the object being produced, with the least possible effect on the eye muscles. As the critical part must "move" forward, the non-critical parts must recede. The widely used machine gray does this to a small extent but is in itself a depressing, morale-lowering monotone. Careful study and research has shown a receding color known as Vista green is best for the bodies of machines and equipment.

In addition to the critical and non-critical parts of the machine,

RED
THE FIRE PROTECTION COLOR



consideration must be given to what may be termed the control parts. These parts include the switches, switch boxes and control panels. They should be painted entirely or in part with focal orange. This color, in sharp contrast with both Vista green and the various focal colors, makes for efficiency and safety in the operation of the machine since it permits the ready location of the switches in routine use, or in time of emergency.

Other Control Parts

Other control parts include levers, handwheels, and similar parts. They may be specified in focal yellow since parts finished in that color will contrast effectively with all others on the machine. Here again, we have the elements of safety and efficiency added to parts of the machine painted according to color dynamics. Both orange and yellow, being high visi-

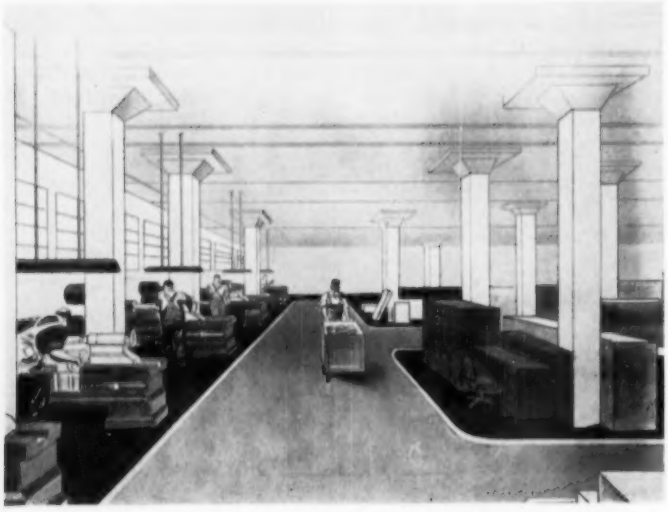
TABLE 1

The Dynamic Use of Color Will:

1) **Promote continuity of employment**
2) **Improve efficiency of operation**
3) **Maintain quality of production**
4) **Encourage pride in equipment and its care**

THE PROBLEM: Workers in machine shops producing precision parts require an environment free from structural distractions, glare, and cluttered working conditions for both their safety and efficiency.

THE SOLUTION: Good use of color "paints out" visual distractions, controls brightness, indicates aisles and storage areas, points up essential machinery controls.



bility colors, provide speed and safety in operation.

Since red is a symbol of danger and fire, focal red should be used on all fire apparatus, including the fire extinguisher or a section of the wall surrounding each extinguisher.

The principles governing the use of color on the interior surfaces of industrial plants is based upon its psycho-physical attributes explained below. It is known that some colors are stimulating, some depressing, and some irritating. These psychological reactions are in turn reflected in the physical well-being of the industrial worker and have a definite effect upon the work he accomplishes.

Fundamental Aims

Cheerfulness, plus restfulness, plus good visibility are the fundamental aims of color dynamics.

The most important wall areas to be considered in painting the interior of an industrial plant are those which face the operators of machines. The worker glances up constantly from his machine. If the wall is decidedly lighter or darker than the machine, it involves a quick adjustment of the eye each time the glance shifts from one to the other. The frequent repetition of this throughout the day has its effect in eyestrain or fatigue. The walls in question should be painted so as to be eye-rest areas. To do this, the wall should not be too far removed in value from the machine—that is, neither decidedly lighter or darker. These walls may be painted in colors selected from the color dynamics wall and ceiling line, preferably blue-green, green or gray. In rooms tending to be dark and cold in effect, a warmer color may be used on any eye-rest wall.

Cluttered Ceiling Areas

The interiors of many factories and shops are so constructed that the entire ceiling area is cluttered with beams, pipes, and other necessary structural equipment. This condition usually makes it impractical to use indirect lighting, and so leaves the way clear to paint the entire ceiling including all pipes, beams, conduits, and other items that appear against it in a soft re-

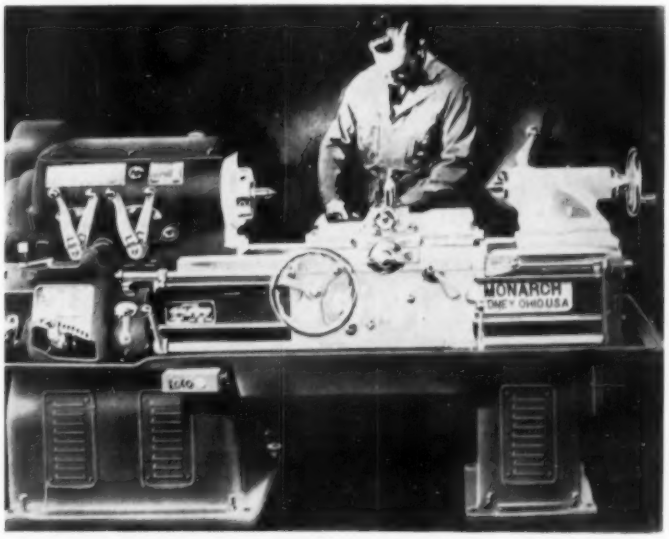
ceding color which will give the appearance of lightness and airiness. Any of the lighter and cooler wall and ceiling colors such as Cascade blue, or a greenish-blue is suitable for this purpose.

If indirect lighting is used, the ceiling must, of course, be painted so as to have the highest possible reflection value. This range would include white, with a reflection factor of 88 percent, or light tints of off-white, ivory, green or other colors made by adding a very small amount of one of the wall and ceiling colors to white.

The proper painting of floors in industrial plants is essential from the standpoint of cleanliness and ease of maintenance. This is reflected in the workers' pride in the surroundings and equipment and interest in its care which result in a general increase in morale. From a safety standpoint also, the correct painting of floors has an important function in the industrial painting program.

The constant passing of motorized and hand trucks, movable bins and other mobile equipment through aisles and traffic lanes is a menace to the workers who stand at their machines at the edge of these areas. In their concentration on their work, the employees are in constant danger of stepping back too far and into the line of traffic. This possibility of accidents is also a mental hazard to the operators of the trucks.

The solution of this traffic problem is in the distinct marking of all aisles and traffic lanes. This may be accomplished by painting the entire width of the aisle in a contrasting color or a contrasting value of the floor color. As an alternate and a successful one, a wide stripe of a highly visible color may be applied at each side of the traffic lane. An ideal treatment is a combination of the two methods. As an example, the main area of the floor might be painted a dark gray, the aisles or traffic lanes in a lighter gray, and the stripe in orange. White is also frequently used for these boundary lines as well as yellow.



The dynamic use of color on machines separates the critical from the non-critical parts. Here, the critical, or operating, parts have been painted a color that comes quickly to the eye in contrast with the surroundings. Colors that stand out from the body color are "focal."

Some types of manufacturing involve the problem of proper lighting of the under side of the objects being fabricated. This is particularly true in the making of large objects which cannot be moved about to secure proper lighting. The solution of this problem is to flood the under side of the products being fabricated with the maximum of reflected light from the floor. The lightest possible floor colors should be used.

A further warning of danger is given if necessary by the use of the highly visible combination of yellow and black. Sections of alternating stripes of the two colors, sometimes in diagonal or chevron stripe effect, are used on areas where collisions are most apt to occur. This would include such locations as the front of motor trucks, the parts of cranes that are over aisles and conveyor lines at points where they are low enough to be traffic hazards.

While color dynamics has been used most widely in the field of industry and received its most outstanding recognition from the application of its principles, it should by no means be assumed that the scope of its benefits is limited to that or similar uses. It may be safely said that any paint job, whether concerned with structure or equipment, can be done better if planned and carried out according to these principles.

Pictures by courtesy of Pittsburgh Plate Glass Co.

Tips On Shaper Safety

(from page 13)

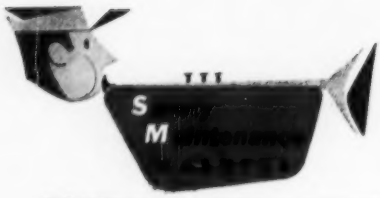
a way that the lower surface of the handscrew and that of the wood piece temporarily become an integral plane; both can be slid over the shaper table together.

This method provides maximum safety, and gives far better control while a very small piece is being advanced to the shaper spindle. It is particularly convenient for use in any case where a very small piece must be run against the shaper collar.

In all instances where it is consistently possible, one should operate on the principle of keeping shaper cutters covered, so it is not readily possible to get fingers into them. Many shaper operators have not realized that it is sometimes possible to use a holddown in conjunction with a shaper fence, through which the cutters are run.

Such men will use the holddown on work which must go directly against the collar, but on setups where cutters run through the fence, they make no attempt to employ anything which encircles the revealed portion of the running cutters. There are various instances, however, where a holddown and a shaper fence can be used together in such manner as to provide perfect safety for the operator.

Picture by courtesy of Greenlee Bros. & Company.



A SAFETY IDEA

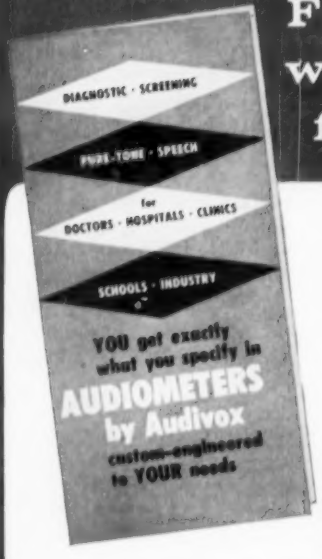
Safety Slogan Contest

The do-it-yourself trend among home owners has now spread to an on-the-job safety program. At Falstaff Brewing Corporation's Plant Seven, in Fort Wayne, employees are making up and submitting their own safety slogans each month to the plant Safety Committee.

The committee selects the best of the reminders for framing and posting in areas where employee interest will be attracted. The suggested slogans are submitted to safety representatives in each department, with new representatives being appointed each month.

Typical recent messages are "You can walk with a wooden leg, you can chew with false teeth, but you can't see with a glass eye,—WEAR SAFETY GOGGLES," and "A careful worker is the best safety device known."

Resident Manager Norman J. Thomas credits the new program with establishing "a new safety consciousness" throughout the plant.



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Dravo Corporation's boat yard on Neville Island in Pittsburgh has received the firm's highest safety honor—the President's Award— for 1956. The boat yard completed 280,744 man hours during 1956 without a disabling injury. Since the yard's last lost-time accident on March 11, 1955, employees have worked 550,624 injury-free man hours.

Three special awards were given for "outstanding performance" in safety during 1956. They went to Engineering Works Division's shipbuilding and marine repair yards at Wilmington, Del., Contracting Division's mine shaft job for Intermountain Chemical Company at Westvaco, Wyoming, and Machinery Division's pipe fabrication shop at Marietta, Ohio.

• • •

Madison-Kipp Corporation, of Madison, Wisconsin, manufacturers of die casting products, recently received an award from American Motorists Insurance Co. for its record of one million man-hours' operation without a disabling injury. The company's more than 300 employees began their accident-free safety record on September 17, 1955.

• • •

For the second consecutive year, Martha Mills textile division of The B. F. Goodrich Company in Silvertown, Ga., has received the first-place safety trophy awarded by the Cotton Manufacturers Association of Georgia. Working without a chargeable accident in 1956, Martha Mills employees completed 3,923,546 man hours without injury. This record was the best in the state out of 114 competing mills.

Through March, 1957, the division has now completed over 10,800,000 man hours without a disabling injury, the last accident having occurred in October, 1954.

• • •

Two fir plywood mills which have worked for over four years without a lost-time accident received safety awards at the recent 21st annual meeting of the Douglas Fir Plywood Association. Three other mills which have built up excellent safety records were also honored with safety trophies and plaques. The awards and their recipients were:

Division I (100,000 hours or less): A tie between the Kosmos Veneer Plant of the United States Plywood Corporation at Kosmos, Wash., and the Idanha, Ore., veneer plant of the Simpson Logging Company.

Division II (100,000 to 500,000 hours): Fortuna Veneer Company of Fortuna, Calif., received the trophy and plaque as winner of Division II for working 479,598 hours with only two lost-time accidents.

Division III (500,000 hours or over): The Weyerhaeuser Timber Company's Longview, Wash., plywood mill won the Division III trophy and plaque for working 737,938 man-hours in 1956 with only three lost-time accidents.

A new award presented for the first time this year was the DFPA Plywood and Veneer Safety Improvement Award. This trophy will be awarded each year to the mill showing the greatest reduction in accident frequency to arrive at a frequency below the industry average. Fortuna Veneer was the first mill to receive the new safety improvement award. Their frequency rate in 1956 showed a 73% improvement over 1955.

• • •

The National Safety Council recently presented its Public Interest Award to Allis-Chalmers in recognition of the company's exceptional service to safety in the area of public information media and advertising in 1956. Allis-Chalmers has been promoting safety through its radio programs and advertisements in newspapers of its plant cities for the last six years. The ads are run before summer vacations begin and again when classes resume in the fall.

More than 10,000 reprints of the 1956 summer safety ad were distributed by the Milwaukee and West Allis Safety Commissions. Thousands of other reprints were distributed to Allis-Chalmers plants in other cities.

This year, more than 33,000 reprints of the company's summer safety ad will be distributed in the Milwaukee area as part of 350,000 reprints, including a French version in Quebec, Canada, that will be distributed in Allis-Chalmers plant cities.

• • •

For the second time within a month, production workers of Nekoosa-Edwards Paper Company have established a new safety record. Employees of the company's Nekoosa mill recently achieved one million man-hours without a lost-time injury. Shortly before, the firm's Port Edwards mill, with some 782 employees, had also passed the millionth mark.

A plaque and certificates from the National Safety Council and the Wisconsin Council of Safety will be presented to the company in recognition of the safety record.

• • •

Donald S. Buck has been cited for Meritorious Civilian Service and Sustained Superior Performance of Duty by Major General Paul F. Yount, Army Chief of Transportation. Mr. Buck, Safety

Director for the Transportation Corps, is a widely recognized authority in his field.

The awards, covering his service from July 1954 to December 1956, pay tribute to his outstanding ability in presenting transportation accident prevention methods and techniques, many of which have subsequently been adopted by industrial and other Governmental agencies as well as throughout the Army.

Mr. Buck, a former Indiana State Trooper and World War II veteran, is credited with conceiving, developing and putting into operation, the motor vehicle safety program of the Army Transportation Corps. This program later became the standard for the Department of the Army.

During 1956, his citation states, "the Transportation Corps recorded the lowest accident rates in its history. Under the technical direction of Mr. Buck, this accomplishment was achieved by prescribing practical and proven methods based on his vast experience in transportation safety matters."

• • •

Two chemical companies were presented with the Lammot duPont Safety Award Plaque at the 85th annual meeting of the Manufacturing Chemists' Association. The awards are made annually to the chemical companies showing the greatest improvement in plant safety over a five-year period.

The winner among those companies whose employees worked more than 2 million man-hours annually was California Spray-Chemical Corporation, Richmond, California. Among firms whose workers put in 2 million man-hours or less annually, the award was presented to Patent Chemicals, Inc., Paterson, New Jersey. The Procter & Gamble Company was runner-up in the first group. Bay Chemical Company division of Morton Salt Company was the runner-up in the second.

The chemical industry, set a new all-time safety record in 1956 with lost time accidents in the industry reduced to 3.00 per million man-hours worked. This is slightly more than one-fourth the preliminary 11.9 million man-hours worked figure for "all manufacturing" as reported by the Bureau of Labor Statistics.

• • •

The Maryland Society for the Prevention of Blindness has presented Armco Steel Corporation's Baltimore Works with a letter of commendation for its promotion of a plant-wide sight conservation program.

Dr. Frederic M. Reese, president of the society, praised representatives of management and union at the stainless steel plant for gaining the co-operation of all employees by developing their understanding of the need for eye protection while on the job.

Early in 1956 Armco began fitting employees in each operating department at the Baltimore Works with safety glasses. Where corrective lenses were necessary to overcome defective vision, employees

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contributed to eye examination costs, while the company bore the total cost of the glasses. By April of this year the final group of employees was included under the eye protection program.

Figures accumulated since 1956 at Armco's Baltimore works indicate that where eye protection was required on specific jobs 20 cases of serious eye injuries have been prevented. Nine of these 20 prevented injuries could have resulted in the loss of sight in one or both eyes.

• • •

The Army Chemical Corps recently received its second consecutive Award of Honor from the National Safety Council in special Pentagon ceremonies. The Corps or its installations has now received a total of 18 safety awards of various types since 1952, seven of them from the National Safety Council.

The trophy was given for the Corps' 30 percent average reduction of accident rates of all types as against averages for the past two years. Also considered in the award was the high degree of compliance with Army standards governing such factors as safety training, accident reporting and analysis, corrective actions, and overall emphasis of safety activities. Emphasizing the financial impact of safety activities, the Corps' 1956 total of $155,160 for direct monetary losses due to accidents, virtually halved the 1955 figure of $303,689.

• • •

The United States Army was presented the National Safety Council's Award of Honor for the fourth consecutive year.

Ned H. Dearborn, president of the National Safety Council, made the presentation to the Deputy Assistant Secretary of the Army Franklin L. Orth in recognition of the Army's outstanding efforts in accident prevention during 1956.

The Award of Honor is recognized as the highest award in the field of accident prevention and marks the 13th award won by the Army since the beginning of the Army Safety Program 15 years ago. During that time, Army military personnel injury rates have been reduced more than 65 percent and Army civilian rates by more than 54 percent. During 1946, there was an Army motor vehicle accident every 38,500 miles, as compared to 53,090 miles in 1956.

• • •

For the second time—a full year without a lost-time injury—has been set by Du Pont Construction Division men at all of Du Pont's 45 heavy building sites in 22 states. Over 10,000 employees chalked up 8,000,000 exposure hours without a lost-time injury. Upwards of 240 major injuries could have been expected if the accident frequency rate had followed that of the construction industry as a whole.

This marks the second time that Du Pont construction activity at a far-flung network of sites has been welded together into one year's perfect safety record. On April 5, 1955, they made a similar record.

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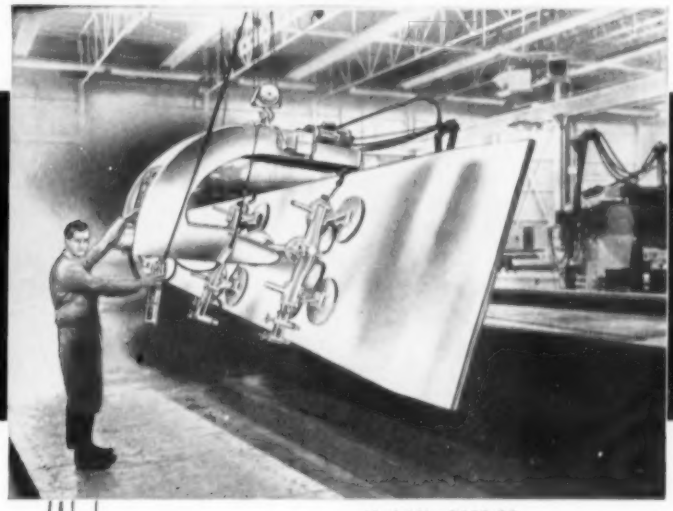

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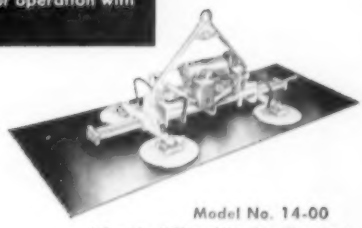

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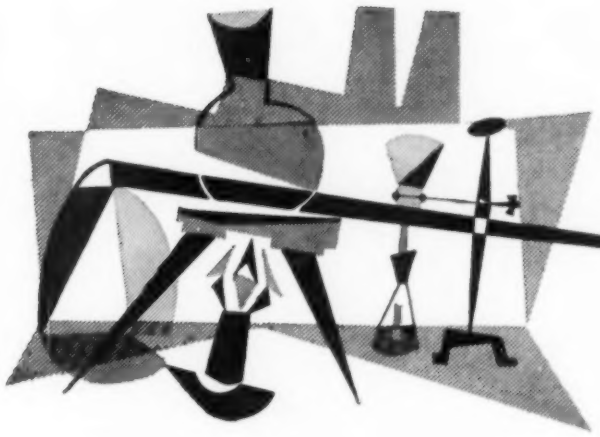


industrial hygiene

Radiation Accident Reports a Must

The Atomic Energy Commission has amended its regulation on standards for protection of workers and the public against radiation to provide that licensees shall promptly notify the Commission of potentially serious accidents involving licensed material.

The reporting requirement applies to all Commission licensees. It becomes part of an existing regulation providing standards for the safe handling of radioactive materials and establishing limits governing exposure to radiation of atomic energy workers and the public.

As amended, the regulation calls for prompt notification to the nearest Commission Operations Office of any incident involving licensed material which may have resulted in appreciable release of radioactive material or excessive exposure of individuals to radiation. This will enable the Commission to assure that appropriate steps are taken immediately to minimize the consequences of the incident, to determine its cause, and to initiate corrective action. Each licensee is required, also, to make a detailed report in writing, within 30 days, of all incidents involving licensed materials, regardless of their nature or extent, resulting in radiation exposures or concentrations of radioactive materials above permissible limits.

Changes in the regulations are:

1. Reports of Theft or Loss of Licensed Material.

Each licensee shall report by telephone and telegraph to the Manager of the nearest Atomic Energy Commission Operations Office immediately after its occurrence becomes known to the licensee, any loss or theft of licensed material in such quantities and under such circumstances that it appears to the licensee that a substantial hazard may result to persons in unrestricted areas.

2. Notifications and Reports of Incidents.

a. Immediate notification. Each licensee shall immediately notify the Manager of the nearest Atomic Energy Commission Operations Office by telephone and telegraph of any incident involving licensed material possessed by him and which may have caused or threatens to cause:

(1) Exposure of any individual to 25 rems or more of radiation, including any radioactive material taken into the body; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5000 times the limits specified for such materials; or

(3) A loss of one working week or more of the operation of any facilities affected; or

(4) Damage to property in excess of $100,000.

b. Twenty-four hour notification. Each licensee shall within 24 hours notify the Manager of the nearest Atomic Energy Commission Operations Office by telephone and telegraph of any incident involving licensed material possessed by him and which may have caused or threatens to cause:

(1) Exposure of any individual to 3 rems or more of radiation, including any radioactive material taken into the body; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials; or

(3) A loss of one day or more of the operation of any facilities affected; or

(4) Damage to property in excess of $1,000.

c. Thirty-day Reports. Each licensee shall make a report in writing within 30 days to the Director, Division of Civilian Application, United States Atomic Energy Commission, Washington 25, D. C., of each incident involving licensed material possessed by him which appears to have resulted in the exposure of an individual to radiation or to concentrations of radioactive material, or to have resulted in levels of radiation or concentrations of radioactive material, in excess of any applicable limits set forth in the regulations

(Continued on page 38)

Do You Have A Noise Problem?

NOISE CONTROL SERIES
other articles in July & September

by **Ervin E. Gross, Jr.**
General Radio Company
Cambridge, Mass.

Noise in industry is not a new problem. Noisy factories have been with us for many years, and until recently they were accepted as an annoying but necessary part of our industrial civilization. Workers in certain very noisy industries who suffered hearing loss bore their loss as a sort of badge or mark of distinction—"boilermaker's deafness," for example.

Today it is widely accepted that workers exposed to high noise levels for long periods not only become irritated and annoyed and exhibit loss of efficiency and aptitude, but may also suffer hearing loss. High noise levels can also create a hazardous situation because speech communication becomes jammed or masked.

Safety engineers and industrial hygienists, therefore, have become vitally concerned with and responsible for noise measurements in many branches of industry. Judgment and skill are required to properly measure and evaluate all types of noise problems, but the judgment and skill must be based on sound engineering and scientific principles. Before undertaking a program of noise measurement, one should understand the nature of what is being measured and know the characteristics and limitations of the equipment to be used.

The sound-level meter is the basic instrument used in noise measurements. Two alternate microphone systems can be used in place of the crystal microphone, normally supplied on the sound-level meter. They are the dynamic microphone with its step-up transformer

WHEN ARE NOISE MEASUREMENTS NECESSARY?

A. The usual reason for making a noise survey is to start a program of preventive noise control. What evidence do you need to tell you that you have a noise problem? There are three general types of evidence:

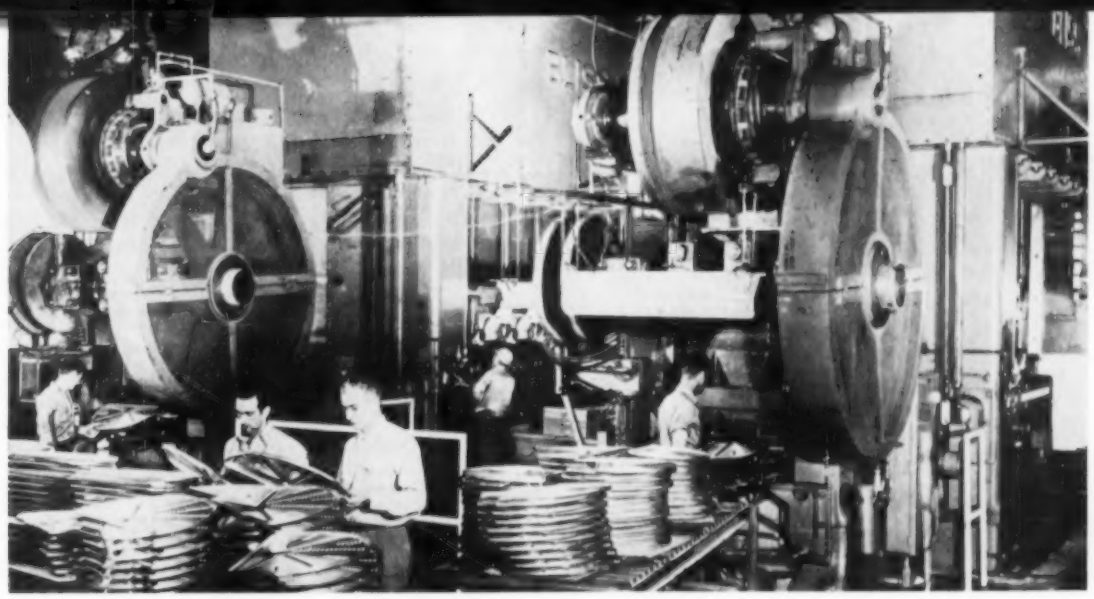
1. *Hearing Damage Risk:* If you have areas in your plant where it is difficult to hold a conversation because the manufacturing operations are too noisy, you have a POSSIBLE noise problem.

If two people with normal hearing cannot hear each other in a shouting conversation at arms' length, you should DEFINITELY measure the noise level. Noise measurements are necessary before you can proceed with a noise control or abatement program.

2. *Communication Impairment:* Even though noise levels may not endanger the hearing of personnel, telephone and other communications may be difficult or impossible. Sound level measurements are then necessary to help determine the best way to improve the situation.

3. *Community Annoyance:* If your plant is in or near residential areas, your problem may be one of community annoyance. Here again noise measurement should be made to determine the best noise abatement program.

B. After control measures are taken, it is desirable to measure noise levels again as a check on the control's effectiveness.



and the condenser microphone with its preamplifier and power supply. The dynamic microphone is used when it is necessary to make measurements with the microphone separated from the sound-level meter by a long cable. It has poorer low-frequency response and somewhat smoother high-frequency response than the crystal microphone. The condenser microphone is used where the best frequency response possible is desired. It has excellent low-frequency and high-frequency characteristics. It can be used on a cable without correction, and models are available for very high-level measurements.

Very few sound measurements are made for purposes of noise control or to determine hearing-damage risk that involve the sound-level meter by itself. Since the ear does not respond uniformly to all frequencies in a noise, something must be learned about the noise spectrum before we can decide how loud or how dangerous it might be. Devices called analyzers, which connect to the output of the sound-level meter, are used to learn this information. They are the octave-band noise analyzer which divides the noise spectrum into eight fixed frequency bands, each one octave in width; the sound analyzer which is a continuously adjustable narrow-band filter; and the impact noise analyzer, to be discussed later.

The octave-band noise analyzer is the one most used for industrial and other noise surveys, and a number of criteria have been developed that are based on octave-band noise measurement. Tentative hearing damage criteria, community reaction to noise, and speech interference levels are some of the useful criteria which are so based. In addition, methods for computing the loudness of sounds are based on octave-band measurements.

The sound-survey meter, due to its small size and light weight, is ideally suited for making initial surveys at points remote from the laboratory or home office.

Satisfactory measurements over a long period of time require that the instruments be kept in good operating condition. Periodic maintenance or calibration checks should be performed at the beginning and end of each day's operation. If the instruments are used only occasionally, their operation should be checked each time they are used for a series of measurements. To make these checks easy to perform, most sound-level meters have an internal calibration system which derives the necessary signal from the 60-cycle power outlet. This calibration check includes the electronic circuits of the sound-level meter plus any auxiliary device or analyzer connected to its output, but does not include the microphone. The acoustic calibrator is a very useful accessory for the sound-measuring system. It fits over the microphone and produces a known sound-pressure level to check the complete sound-measuring system from acoustic input to analyzed output.

Noise Measuring Techniques

There is no single set of answers to the questions that arise when one is faced with actually making a noise measurement. The answers for any one noise problem depend, among other factors, upon the type of noise source being measured, the environment in which the noise is to be measured, and the reasons why the noise is being measured. Here are some of the rules that have proved useful to others who have been given the task of noise measurement.

1. When the sound-level meter or sound-survey meter readings only are required, as is the usual case in initial noise surveys, be sure to always record the weighting network used when taking the readings. A procedure often followed is to take readings on all three weighting networks even though readings on only one network are indicated. Readings on all three networks will often yield much additional useful information.

2. If the sound-level meter is held in the hands, the operator should stand so the noise source is at his left or right, rather than directly in front of him. When he

WHO SHOULD MAKE THE NOISE SURVEY?

Once you have decided that a noise problem may exist and that noise measurement should be made, you must decide who should make the measurements:

1. If you have a single questionable spot in your plant, the most economical solution may be to employ a consultant. There are a number of acoustical consulting firms distributed throughout the United States. Also, some state industrial hygiene organizations will do survey work, and several insurance companies provide this service to their policyholders.

2. If you have many noisy spots in your factory which will require a continuing program of measurement and control, the best solution may be to train an engineer from your plant or to hire an acoustical engineer. The decision here will be based largely on economic factors and upon the availability of technically trained personnel. If the decision is to use someone from your own organization, you will find the instrument manufacturers ready and willing to instruct the purchasers in the proper operation of the equipment.

holds the instrument in this fashion, sounds passing by the microphone directly from the source do not reflect from the operator's chest and interfere with the sound field at the microphone. Rather large errors in readings can occur if the operator places the microphone between himself and the noise source.

3. When high frequencies are present and readings of highest accuracy are required, the microphone should be placed on a tripod and separated from both the sound-level meter and the operator by an extension cable.

4. When the problem is to measure the noise level at a machine operator's ear, the accepted procedure is to ask the operator to step away momentarily and measure the noise level at a point in space where his ear would normally be.

Analysis Necessary

When a serious noise problem exists, analysis is almost always necessary. For convenience, the instruments are often mounted on a small rubber-tired truck or tea wagon. The instruments can then be readily moved about and the operator's hands are free to adjust knobs and record data.

High-level noises, above 120 decibels re. 0.0002 microbar, require that the instrument operator be alert at all times to possible malfunctioning of his equipment. All electronic equipment suffers to some degree from microphonic or spurious signals caused by vacuum tube elements which vibrate when excited by high intensity sound fields or motion transmitted through the instrument case. Microphonics are most easily detected by listening for the characteristic bell tones in the output of the instrument with a pair of earphones. Microphonics are also evidenced by meter readings that seem to drift slowly up and down, by metered readings that do not change with attenuator settings, or by meter readings that do not fall by a large factor when the input to the instrument is removed. When microphonics are detected, the situation can often be improved by reorienting the instruments or mounting them on soft sponge rubber pads or holding them in the hand. Occasionally, it is necessary for the well-being of the operator and instrument to mount the microphone on a long cable and move the instruments and observer to a point of lower sound intensity.

One very important part of any measurement problem is that of recording the data, and the most important consideration in recording data is completeness. To make sure that all of the desired data are recorded, it is a good idea to use prepared forms for recording data in the field. Sheets may vary in detail depending upon the purpose for which the measurements are to be made, but any such forms should have definite spaces for essential information. Table 1 shows a list of important items that should be included on prepared forms of this type.

This is a long list, but all items are important. In addition, since these forms are used primarily for hearing-damage risk surveys, there should be additional space for information about personnel exposed to the noise as well as medical control and audiometric examinations. It is good practice to keep all sound-survey data on file for future reference even though measurements indicate a noise-control program is unnecessary.

(Continued on page 38)

TABLE 1.

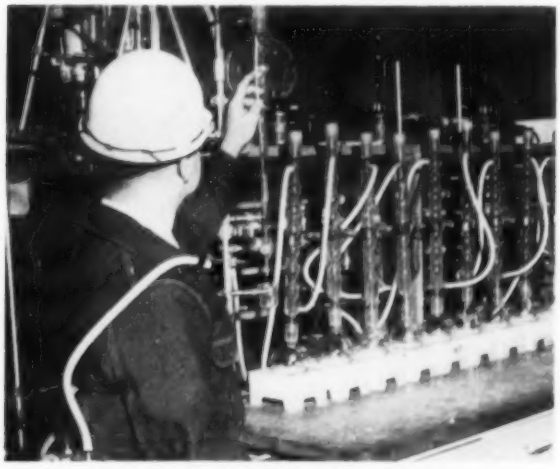
1. **Description of space in which measurements are made.**
2. **Description of device under test.**
3. **Description and location of other noise sources.**
4. **Types and serial numbers of all microphones and instruments used.**
5. **Position of microphone.**
6. **Temperature of microphone.**
7. **Results of calibration and maintenance checks.**
8. **Measured overall and band levels at each microphone position.**
9. **Background overall and band levels at each microphone position.**
10. **Cable and microphone corrections.**
11. **Date and time of measurement.**
12. **Name of observer.**

new air sampler

New jet air sampler, powered by a small container of propellent, fits in one hand, for collecting air contaminants.

A relatively inexpensive and simplified air sampling device, small enough to be held in the palm of the hand, has been developed by Du Pont industrial hygienists to help ventilation engineers determine what harmful substances might be in the air.

Weighing less than two pounds and costing only a fraction of existing equipment for doing the same job, the new device substitutes a miniature jet engine powered by a can of low-pressure liquefied gas for the bulky hand or motor driven pump and dry gas meter or flow meter required with older type air sampling equipment. Other than a valve to control the supply of compressed gas, the device contains no moving parts, thereby reducing or eliminating operating and maintenance problems.



Air sampling is sucked into tube through device attached to worker's collar. Thus sample duplicates air he is inhaling.

An advantage of the new equipment rests in its small size and built-in explosion-proof power source which permits collection of air samples under actual operating conditions and in cramped or crowded quarters, without extra personnel to operate the collecting device. Where it's desired to sample the air being breathed under actual working conditions, for example, the device can be attached to the worker's trousers belt and a light, flexible tube run from it to the worker's jacket collar where the end of the tube can be taped to assure that the sample of air being collected duplicates as closely as possible the air actually being inhaled by the subject.

Principal part of the air sampling device is an aspirator or "pump" utilizing a micro-venturi principle in which Du Pont "Freon" propellent is ejected through a jet nozzle at high speed, creating a vacuum in the venturi cavity. Different size orifices can be inserted between the supply container of the propellent and the venturi jet to control, automatically and continuously, the operating pressure of the aspirator and the air sampling rate.

The amount of propellent vapor vented from the aspirator, under ordinary conditions, does not dilute an air sample sufficiently to introduce significant errors, according to tests conducted by Du Pont's Industrial Hygiene Laboratory. And, because it derives its operating power entirely from the flow of the nonflammable, nonexplosive and virtually nontoxic "Freon" and has no moving parts which might generate static electricity, the jet sampler is safe for use in any type of atmosphere.

For most air sampling, with the exception of solid particle counts, the suction end of the aspirator is connected to a standard glass impinger assembly of

(Continued on page 40)

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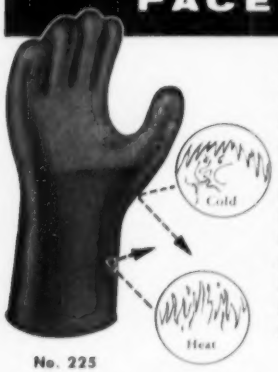

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(For details, use Key # G-15 on card on page 1)

Do You Have a Noise Problem?

(from page 36)

Some of the noisiest machines in industry produce impact or pulse-type noises. Noises of this type are produced by air hammers, riveters, chippers, punch presses, and drop hammers. The usual sound-level meter and frequency analyzer can tell us very little about this kind of noise. The ballistics and time constants of meters designed to measure steady-state signals are so slow that the indicated amplitude of an impact can easily be too low by as much as 30 to 1. The impact analyzer mentioned earlier has been developed to help workers in the noise measurement field learn more about impact noises.

First, let us consider the characteristics of an impact noise from a single strike of a punch press doing a simple forming operation. The peak level is 120 db (re. 0.0002 microbar), and it occurs about 5 milliseconds after the first sound from the impact. At 1 millisecond, a level of 119 db is reached. After this initial rapid rise, the level decays so that after 30 milliseconds, it is well below its maximum. While there is a general trend of a rapid rise to a maximum value and a slower but still rapid decay, successive peak amplitudes vary appreciably. Two separate handclaps will have decayed to a small part of the maximum value in about 4 milliseconds instead of the 30 milliseconds of the punch press. If we define the decay time for impacts in the same way we do for electrical circuits, that is, the time required for the sound pressure to fall to 37% of its maximum value, we can say that the impact for the punch press had a duration of 30 milliseconds while the handclaps have a duration of 4 milliseconds.

The impact analyzer has been designed to help us measure the peak value and the time duration of impact sounds with the impact analyzer attached to a sound-level meter. A unique feature of this instrument is its ability to make the necessary measurements on a single impact of short duration and store the information so that it can be conveniently read on a single meter. There are three measuring circuits in the instrument, and the panel meter is connected to any one of the three by means of a selector switch. The three circuits are labeled QUASI PEAK, which is used for repetitive sounds and for calibration, PEAK, which is used to measure the peak amplitude of an impulse, and TIME AVG (time average), which, in conjunction with the PEAK circuit, is used to measure the duration of the impact.

From an address presented at the 26th Greater New York Safety Convention. Picture by courtesy of E. W. Bliss Co.

Radiation Accident Reports a Must

(from page 33)

or in the licensee's license. Each report required under this paragraph shall describe the nature of the incident, the extent of exposure of persons to radiation or to radioactive material, the levels of radiation and concentrations of radioactive material involved, the cause of the incident, and corrective steps taken or planned to assure against a recurrence of the incident. A copy of each report shall be transmitted to the Manager of the nearest Atomic Energy Commission Operations Office.

by **ROSLYN WILLETT**

Do You Drink Enough Water?

Outdoor workers require a ready source of clean, fresh, cool water to replace perspiration, especially in summer.

As a result of research in two completely different areas, it would seem worthwhile to re-examine present methods of supplying drinking water to both factory and office workers. One series of studies by Dr. Lucien Brouha of the Haskell Laboratory of Toxicology raises the question of whether workers drink enough water and what happens when they don't. The other, conducted by Dr. W. L. Mallmann of the Department of Bacteriology of Michigan State University, raises a problem of drinking fountain design.

For years, Dr. Brouha says, the importance of quantity water consumption by industrial workers to replace water lost through muscular exertion has been recognized. And there have been educational campaigns urging water consumption for maintenance of the individual's well being. For a long time, workers as well as other people have been told to "drink plenty of water."

"The trouble with that," says Dr. Brouha, "is that no one ever told the worker how much water is enough. The individual is left to judge what is enough, and this he cannot do accurately." This presents a management problem.

Dr. Brouha's findings are in direct contradiction to previously held theories that the human body is a self-regulating mechanism which will automatically demand the water it needs to make up losses due to muscular exertion. Up to now most observers have believed that it was not necessary to "force" water. Dr. Brouha stresses that self-regulation operates, but that there is a time lag. Ordinary thirst does not cause the body to catch up on its water supply quickly enough to maintain top efficiency and comfort.

He has found that in heavy work, a man loses as much as 12 quarts of water during eight hours of work. He has also found that if the water loss isn't made up by drinking water all day on the job, the man's temperature goes up, his heart rate goes up, and he becomes tired very quickly. He does not usually feel thirsty until quite a long time after the body effects of too little water show themselves.

For example, Dr. Brouha found that when drinking was insufficient to replace water loss (which he measures by the difference in body weight) high heart rates and body temperatures over 100 degrees were frequent. When workers drank more water, body temperatures over 100 degrees disappeared, and heart rates did not go so high or take so long to come back to normal.

When the amount of water workers drank was increased, it was found that heart rates at the end of the day were the same or only slightly higher than at the beginning of the day, and that body temperatures remained the same all day. In other words, the men were physically fresher and able to do almost as much at the end of the day as at the beginning.

Even sedentary workers in air conditioned offices lose about a quart of water a day through perspiration. All workers suffer more from fatigue and a drop in on-the-job-efficiency if they do not make up water losses immediately.

In view of these findings, he concludes that: Keeping a balance between fluid intake and fluid loss is a matter of training, because most people who are sweating

Under extreme conditions, factory workers may lose as much as 12 quarts of water a day which must be replaced at a regular rate to keep them in top shape.

profusely will drink only about two-thirds of what they eliminate on an hourly basis. If the water balance is to be maintained throughout an eight-hour shift, one has to drink more than is necessary merely to quench his thirst.

In commenting upon the need for training workers to drink water, Dr. Brouha says: "We have found that the best practical technique is to provide paper cups near each drinking fountain and explain to the workers that in order to replace that amount of sweat lost they should drink an average of so many cups at the end of each work period. The number of cups can be experimentally determined by studying the average weight loss of the workers involved in various jobs. The men learn rapidly how to force their water intake to compensate more accurately for their sweat loss, and a definite improvement in physiological reaction is seen." He points out that cups are preferable as sources of water, because they permit precise check on intake.

Even people in offices feel better and work more efficiently if they maintain correct fluid intake.

While Dr. Brouha studied the adequacy of water intake, Dr. Mallmann assisted by Antone K. Fontes, investigated the sanitation aspects of some of the ways in which water is made available.

The sanitation problem in regard to water fountains is one which is coming in for increasing attention in public health circles. It had long been generally accepted by health authorities that vertical jet bubblers are insanitary. For this reason, so-called "angle-jet" fountains are commonly used. These have shields to protect the orifice from accidental lip contact.

Present Potential Hazards

But, both past and current research studies indicate that fountains still present potential health hazards. The studies of A. P. Hitchens and O. A. Ross at the University of Pennslyvania showed in 1943 that respiratory germs are present on the nozzle and in the bowl of drinking fountains. Mallmann and Fontes have confirmed the Hitchens and Ross findings as well as similar findings by earlier investigations.

In addition, they have demonstrated that the use of drinking fountains creates an aerosol which results in the deposit of washings from the mouth on nearby surfaces and in the air around the fountain, thereby endangering the next drinker. This work showed that jet fountains can be contaminated and frequently are.

In an article reporting his findings in the June issue of the American Medical Association publication, Archives of Industrial Medicine, Dr. Mallmann concludes: "Aerosol contamination of the immediate neighborhood of drinking fountains may be one factor in the high rate of nuisance ailments or absenteeism. Since it can be dealt with expeditiously and inexpensively by a reconsideration of fountain design and service factors—the effort would seem to be well worthwhile to industrial hygienists."

Pictures by courtesy of Field Research Division, Paper Cup & Container Institute.

New Air Sampler

(from page 37)

about 40 milliliter capacity. Samples of air to be analyzed are bubbled continuously through a test solution in the impinger, and the amount of the pollutant being sought is determined by color changes in the test solution or by a subsequent quantitative laboratory analysis of the test solution through which the air sample was scrubbed.

Typical chemical pollutants which can be determined with the instrument include acid fumes, nitrogen oxides, sulfur dioxide, toluene diisocyanate, phosgene, and hydrogen sulfide.

For dust sampling, where a particle count or radioactivity survey is desired, a standard "Millipore" filter attachment is substituted for the glass impinger. Dust particles caught on the special filter paper are then counted or measured in microanalytical equipment.

The new air sampling device is available commercially. The name and address of the manufacturer can be obtained on inquiry to the editor.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . Master Superior Court, New Jersey American Bar Ass'n, New Jersey Bar Ass'n, Chairman, Committee on Workmen's Compensation, New Jersey Bar Ass'n National Federation Insurance Counsel Past Commander, American Legion, Post 10, ... Newark, N. J.

BACK INJURY—Right To Medical Expenses

The evidence properly showed that a congenital back defect was permanently aggravated or increased due to an accident admittedly arising out of and in the course of claimant's employment. He was entitled to compensation until the disability terminated or until the full statutory payments are made, but the order of award must be amended to provide only for such medical expenses as were incurred in accordance with statutory authority and not otherwise. On November 7, 1954, claimant injured his back while shoveling gravel into a cement mixer at his employer's plant. Claimant had an admitted congenital back defect at his fourth and fifth lumbar vertebrae and at the sacrum, but the facts disclose that this pre-existing congenital condition did not prevent claimant from performing hard physical labor for the employer for over five months immediately preceding November 7, 1954. It is undisputed that the accident occurred and that it arose out of and during the course of the employment. From the record it is clear that claimant could not work after the accident. He has shown the causal connection and the proximate result. It is also determined that the disability has not terminated to the final date in the records. Claimant is still temporarily and totally disabled as a result of the accident which aggravated the pre-existing back condition. Payments properly must continue, therefore, for total disability until either the claimant has recovered or until the full statutory benefits have been paid. The record also shows that claimant needed a spinal fusion operation as a result of the condition caused by the accident. He had it performed by his private doctor without following statutory method of procuring his own surgeon. The fact that the operation was unsuccessful does not bar him from his just compensation benefits as to other than his privately incurred and unapproved bills. Affirmed with amendment.

Vanadium Corporation of America v. Sargent, Colorado Supreme Court, No. 18092, February 18, 1957.

HEART CONDITIONS—Strain and Exertion

Compensation was properly awarded for the death of an employee who suffered an acute myo-

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(Use Key # G-17 on Inquiry Card on page 1)

cardial injury and infarction. In the course of his work he and a co-employee carried a life guard stanchion weighing 200 pounds for 200 feet and then lifted it over a fence. There was some controversy that the employee's known diabetic and arteriosclerotic condition was a contributing cause of his death, but the board correctly found, upon competent medical testimony, that decedent's arteriosclerotic condition was not advanced to the point where it could cause vascular damage, and acted properly in finding that decedent's death resulted solely from the accident. Affirmed.

Scarangello v. Town of North Hempstead, New York Supreme Court, Appellate Division, Third Judicial Department No. 75-12. April 10, 1957.

INJURY FROM BLOOD TEST—Legal Requirement for Employment

An employee was not entitled to receive compensation for an injury sustained while being given a blood test required by law in order for her to continue to hold her job, since the injury did not constitute an accident arising out of and in the course of her employment. The defendant employer was under compulsion of law to see that the employees in his dairy took a Wasserman test each six months. If he failed to see that such tests were made and to furnish evidence thereof, his dairy would become subject to immediate suspension of permit. As a result of such test, plaintiff employee's arm became infected. The authorities seem to hold that where the employee is required by law to have a blood test in order to obtain or retain employment because of the nature of the work, if the employee becomes infected as a result of such test, the disablement resulting therefrom is not a compensable accident that arose out of and in the course of the employment, notwithstanding the fact that the employer pursuant to his statutory duty had ordered the employee to take the test. The requirement therefor is the state's, and not the employer's. Reversed.

King v. Arthur T/A Arcadia Dairies, North Carolina Supreme Court. No. 98. March 6, 1957.

Trip Tips

The new revised 1957 edition of "Trip Tips," a booklet published by the America Fore Insurance Group containing helpful hints for the motor traveler, has been printed and is ready for distribution.

With emphasis on highway safety, the 40-page booklet gives helpful suggestions on how to prepare the home for vacation absence; instructions on bad weather, desert, mountain and night driving; information on traveling outside the United States; fire prevention and accident prevention.

Included are up-to-the-minute manufacturers' instructions for handling all makes of automatic transmission systems when they become disabled and the automobile requires towing or pushing.

The small booklet fits easily into a car's glove compartment. Single copies of this popular and widely-circulated publication may be obtained through America Fore agents or by writing to Advertising Department, America Fore Insurance Group, 80 Maiden Lane, New York 38, N. Y.

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(For details, use Key # G-19 on card on page 1)

THE FIRE FRONT

Lightning Can Be Controlled!

Lightning, as one of the wonders of nature, has been viewed through countless centuries as a force of might and mystery. Scientists have, of late, been able to bring forth an explanation which clears the mystery. We now know that the strokes we see are a result of an accumulation of static electricity in the sky and on the earth; and, while we cannot prevent the occurrence of the phenomenon, it is possible to divert its energy harmlessly.

Particularly vulnerable targets are the thousands of new suburban buildings cropping up in once rural areas. Never having had the opportunity to acquaint themselves with a protective lightning rod system so familiar to a modern farm family, this new suburbanite is unaware of the necessity for safety in the face of the increased danger of this new location. The more open the location of the building, the more it beckons to lightning. Modern plumbing and electrical equipment adds to its vulnerability. Many of these materials are excellent conductors of lightning which can cause severe damage.

Only a properly engineered and installed lightning protection system is adequate assurance against the loss of life and property. A trained lightning protection engineer can design a system of rods (known as air terminals), cables, and ground bars, which will completely eliminate any damage from this force from the sky. Each system is individually planned since architectural form, interconnection to all major metallic bodies, and types of soil surrounding the structure must all be considered. The entire system of carefully placed rods and deeply grounded conducting cables allows the electrical charges to be carried harmlessly into the earth.

Informative booklets on lightning and lightning protection are available from United Lightning Protection Ass'n., Inc., 404 Jefferson Bldg., Syracuse 2, N. Y.

May Losses Drop

Estimated fire losses in the United States during May amounted to $79,045,000, the National Board of Fire Underwriters has reported. This loss represents a decrease of 9.8 percent from losses of $87,681,000 reported for May, 1956, and a decrease of 8.1 percent from losses of $85,994,000 for April (1957).

Losses for the first five months of 1957 now total $480,445,000 an increase of 8.5 percent over the first five months of 1956, when they amounted to $442,633,000. These estimated losses include an allowance for uninsured and unreported losses.

Flame-Spread Tests

A new apparatus that will secure precise measurements of flame spread and permit thorough investigation of burning characteristics of all types of construction materials has been demonstrated at United States Testing Company, main laboratories, Hoboken, New Jersey. This equipment provides manufacturers and builders with much needed design data for reducing fire hazards.

By measuring the rapidity and severity of flame propagation, the test assesses quantitatively those variables that contribute to the spreading of fire along the surface of building materials. Close agreement of these measurements with observed performance of materials during fires shows a marked advance over previous attempts at flammability evaluation, it is said.

Construction of this testing unit and its fireproof chamber follows the design originated in the Fire Protection Section, National Bureau of Standards. In addition to correlation with actual burning performance the test is especially useful because of its speed and the fact that it can be run with relatively small samples.

This method employs a radiant heat source in front of which a 6 by 18 inch sample of the test material is mounted. The sample is placed so that ignition is forced near the top and the flame progresses downward. A Flame Spread Index for the material is calculated from the rate of progress of the flame front, together with a factor involving the rate of heat generation.

Nuclear Fire Problems

If we are to have fire safety in industrial atomic reactors they must be specially designed both for fire prevention and for the safety of firemen and the public in the event of fire, and they must have competent plant managers in charge all the time, the National Fire Protection Association was told at its annual convention. Fire problems of atomic reactors in industry were considered at a special symposium by NFPA Chief Engineer Horatio Bond, Consulting Fire Protection Engineer A. L. Brown and others.

Brown pointed out that intense nuclear radiation would hamper normal firefighting methods and interfere with efforts to hold down losses. He emphasized these safety factors as vital in planning a nuclear fission reactor:

Selection of a safe location, providing containment and shielding to protect employees and the public and holding down damage to property.

"Buildings and equipment should be designed to retain radioactive substances," he said, "including the water used for fire fighting." And he said buildings should be designed for easy and effective de-

contamination after an accident such as fire.

Bond said that besides safety design in building, the methodical organization of personnel for fire safety will be vital in a nuclear reactor plant.

"A nuclear reactor plant requires the presence of a responsible manager on a 24-hour-a-day basis," he said, adding, "This is likely to be provided in the case of power plant but not in some research reactors."

Not the Answer

Bond said it is not enough to leave an idle reactor only in the care of custodians, and nuclear reactor fires or other emergencies can't be solved simply by calling the local fire department.

Decisions which may involve shutting down or isolating parts of the plant must be made in advance and the person to make such decisions must always be on hand. There must be a fire staff organization—not just a fire brigade, he said; a fire safety staff man must develop fire protection procedures and policies and the manager must make them effective.

Department heads, he said, will have to see that their workers know what to do in an emergency. And Bond said there must be further organization for orderly movement of people from any danger area to one of safety.

Bond said reactors must have protection against fires starting among combustible materials—as fires start elsewhere. And he recommended automatic sprinkler systems or special water systems wherever fires may have to be fought.

In designing plants, he said, it must be determined in advance just where smoke, heat and combustible gases will go and there must be designed drainage and collection provisions for water used in reactor fire fighting, since it may be radioactive.

Fireman Stanley Rosporski of Pittsburgh points to a sliver of glass which became embedded in his Fireman's Helmet during a recent fire. Rosporski, with the crew from a downtown Pittsburgh station, was fighting a blaze in a private club when a window fell from the third floor of the building. The glass broke across his head and shoulders, but he received only a slight cut on his right shoulder. When he returned to the station, he discovered the glass embedded in his hat, which is a one-piece laminated bakelite helmet molded under high pressure.

Picture by courtesy of Mine Safety Appliances Co.

While many parts of a reactor plant will not require special fire fighting measures, areas requiring special procedures must be clearly marked and the special measures fully understood. Furthermore, the public fire department or other fire fighters must be acquainted in advance with problems they may encounter.

Must Be Protected

Fire fighters, he said, must be protected from unnecessary danger, and at the same time improper emergency measures should not unreasonably interrupt plant operations.

I. S. Watkins, chief of the fire department of "Atomics International," a division of North American Aviation, Inc., described a reactor in which the rate of nuclear fission is moderated with graphite and in which the cooling agent is liquid sodium with which his company is developing atomic power.

He warned that sodium is very active chemically and the use of liquid sodium or an alloy means fire may result from contact with air or water. He said, however, that experiments by the Atomic Energy Commission have shown that proper precautions can greatly reduce the dangers.

Leak Would Show Up

Atomics International experimentation, he said, showed that the transfer of heat from the liquid sodium to water—to make steam for power—can be done safely by interposing mercury which acts both as a heat exchange medium and as a buffer between the water and the sodium so that the water or sodium cannot come into contact by leaks. A leak in the heat exchanger would show up at once, he said, by a change in the pressure of the mercury.

Winthrop M. Jones, chairman of the NFPA Committee on Atomic Energy, told the symposium that a brochure in plain language is being prepared for fire protection engineers with nuclear problems to explain to nuclear physicists, designers and engineers the basic principles of fire prevention and protection.

STRONG ARM AGAINST FIRE: THE PLANT BRIGADE

Danger from fires has been greatly minimized at Armstrong Cork Company's huge Floor Plant in Lancaster, Pennsylvania, through development of a highly efficient fire brigade training program.

Throughout the year, members of the fire brigade are given instruction in the latest fire-fighting methods and equipment and every spring or early summer they are taken outside for field training—practice in putting out actual fires through methods they have studied.

This training program, which has been a potent force in preventing fires and quickly confining those few that do break out, was developed by company Safety Manager Amos Keen and D. M. Essick, Assistant Manager of Training, Education and Plant Personnel Administration.

Similar programs, although on a smaller scale, are carried on at Armstrong's 17 other plants in the United States.

Field training, the most colorful part of the program, is handled by the plant fire marshal or the fire chief at a number of plants. Outside fire officials supervise the training at several other plants. For instance, the State Fire Marshal

ABOVE

Fire Brigade members try out various nozzles as they play water upon blaze.

FIRE PROTECTION SERIES
other articles in Sept. & Oct.

BELOW

Assistant plant fire marshal tells men in brigade purposes of each nozzle type.

directs the field training for the Fire Brigade at Armstrong's glass plant in Dunkirk, Indiana, and the city fire chiefs direct the training at the company's tile plant in South Gate, California, and the tile and industrial specialties plant at South Braintree, Massachusetts.

Keen said the firemen are trained specifically to handle the types of fire that could break out in their individual plants. Although the training they receive covers a fairly wide range, it is primarily tailored for fighting plant fires. Many members of the plant fire brigades use their training to aid volunteer companies in their home communities.

Plant firemen direct a stream of foam on a tank of burning solvent during annual field training exercises. Adapter sucks chemical from can into hose.

Armstrong's biggest Fire Brigade—the 90-member team at the huge Floor Plant in Lancaster, Pennsylvania—is entirely company-trained. It has just recently completed three weeks of field training.

The Floor Plant, which employs approximately 4,000 persons, is a small community in itself involving many different manufacturing operations for producing resilient floors of linoleum and plastic sheet goods and tiles, asphalt tile, printed floor covering, adhesives and other industrial specialties. The plant includes 199 buildings covering 2,500,000 square feet of floor space. Just as a small community needs a fire department, so does the Floor Plant need an internal fire fighting force capable of reaching the scene of any blaze almost immediately to protect lives and property.

More than 90 percent of the buildings are protected by a sprinkler system—practically all of the plant with the exception of areas housing extensive electrical equipment which might be ruined by water.

Despite this safeguard, the company feels a well-trained Fire Brigade is needed to give the plant maximum protection 24 hours a day. Most of the men are drawn from the Yard force which handles the unloading of raw materials, truck driving and other miscellaneous labor. In the event of fire, they drop whatever they are doing at the moment and report to their stations.

These men are trained for their additional duties as firemen on company time. Once a year in May or June the men undergo field training so that they will know how to handle the equipment and how to work as a team.

There are 30 firefighters on each of the three shifts at the Floor Plant. Each shift receives six hours of field training during two sessions a week. The training for the entire group is completed in three weeks.

The operation is directed by Plant Fire Marshal George Nickel with the aid of Assistant Fire Marshals G. A. Terriman and H. T. Levan. The Fire Brigade is directed by Fire Chief W. E. Evans, whose regular job is Yard Department General Foreman. Six shift foremen, two on each shift, act as Assistant Fire Chiefs.

First of the two field training sessions is devoted to methods for combatting Class A fires—common fires of paper, wood, cloth, etc., which can be extinguished by water. They learn how to handle hand extinguishers, a 40-gallon wheeled extinguisher and the large hoses with the different types of nozzles for spray, solid stream and fog. The biggest fire they bring under control is composed of wood pallets piled 20 feet high and 60 feet in diameter.

The second three-hour session, held on another day the same week, teaches the men how to extinguish Class B fires—flammable liquids, oils, solvents, gasoline and other chemical type fires. They are taught how to use hand and portable extinguishers containing foam, carbon dioxide and dry powder and how to use both chemical and liquid extinguishing agents with appropriate nozzles and hose equipment to put out larger fires. They practice on tanks of flaming solvents.

In addition to Class A and B fires, the men learn how to combat Class C or electrical fires, although they do not actually participate in any field experiments.

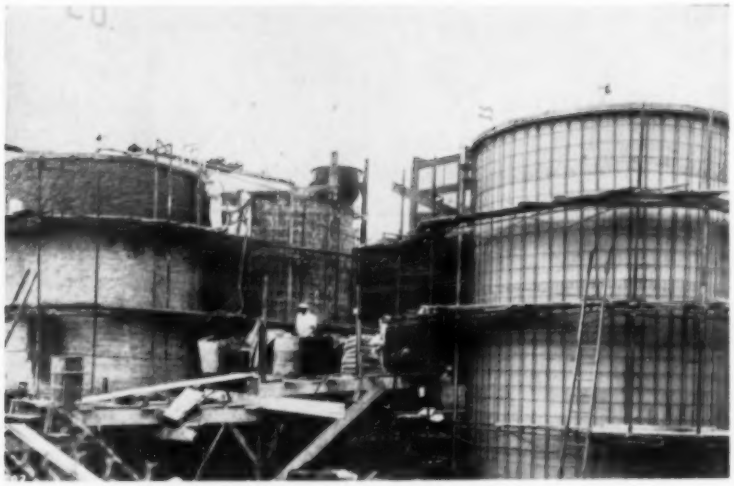
At these sessions they are cautioned to be careful with the reminder: "We can build buildings; we can't repair a man."

There is one main firehouse at the Floor Plant where the hose wagon, the equipment wagon and other firefighting equipment and uniforms are kept. Fire hoses averaging 150 to 200 feet in length are located at 45 strategic places in the plant. Hand extinguishers are all over the plant and all people who work near them are taught how to use them.

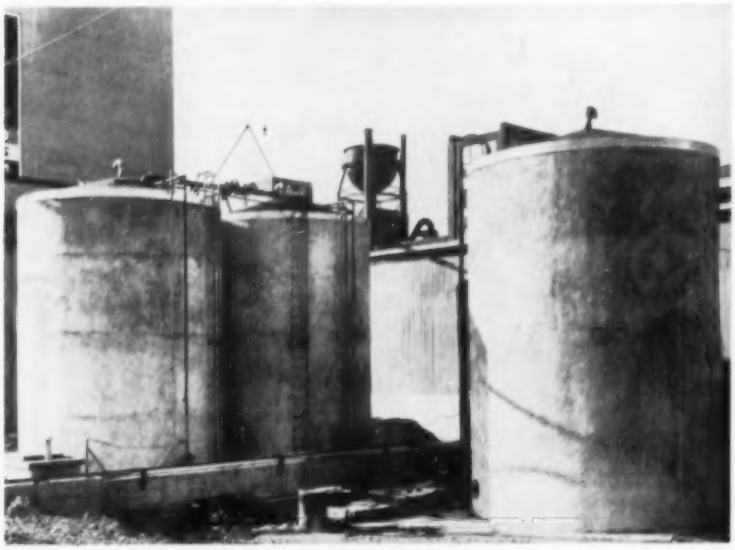
The company has had very few fires and those that did occur were mostly of a minor nature. However, the company wants to be prepared to handle any emergency that could arise at any of its 18 plants in the United States.

fireproofing the fuel tank

Perlite concrete fireproof barrier put around fuel tanks quickly, economically.



Three stages in fuel tank fireproofing: 1—Wire lath, steel framework is set up; 2—First concrete coat is applied; 3—Final coats on barrier completed.



Completely fireproofed with a 6-in. barrier of perlite concrete, these tanks now meet all fire regulations, thus permitting extension of adjacent building.

A new technique has been developed for protecting gasoline and oil storage tanks from the dangers of fire and evaporation loss by protecting them with perlite insulating concrete. United States Gypsum Company recently used the new method on three medium-size fuel tanks at its Philadelphia plant. In this case, the company wanted to enlarge one of its buildings that was very close to the 50,000 gallon fuel tanks but was unable to do so because of municipal fire regulations. Approval was granted, however, after the tanks had been fireproofed with concrete made with perlite—an expanded volcanic mineral that is being used in place of heavier sand in gypsum plaster and insulating concrete.

At the same time the perlite concrete serves as an effective insulator to minimize evaporation loss. In many instances, and with fixed-top storage tanks in particular, heat input through the tank shell and other causes of vaporization permit profits to boil out into the atmosphere.

Additionally, the perlite concrete protects the metal tanks from rust and weather and is rot and vermin proof. As a result, annual tank maintenance costs are slashed. The white perlite concrete also creates a highly-pleasing, textured, monolithic surface that is easy to keep up.

Application of a six-inch thickness of perlite concrete around the tanks (18′ diameter x 27′ high) was

(Continued on page 54)

FIRE-RESISTANT HYDRAULIC FLUID

A new fire-resistant hydraulic fluid, which has been developed by E. F. Houghton & Co., has been compounded expressly for systems operating at temperatures above 150 degrees F. and for heavily-loaded pumps and bearings. Known as Houghto-Safe 1020, the synthetic fluid offers a greater film strength and lubricity and is fortified with rust preventives and anti-foaming agents. This fortified fluid is a companion to the original water-base material, Houghto-Safe 620, suitable for most applications.

The new Houghto-Safe 1020 is the latest fire-resistant hydraulic fluid developed by Houghton's continuing hydraulic research program and is designed only for those systems where high operating temperatures and heavily-loaded pumps and bearings call for specially compounded synthetic fire-resistant fluids.

For details, use **Key # LH-1** on Inquiry Card on page 1.

LIQUID HOSE COUPLING

Universal Valve Company announces the new Long Shank Type #800 Liquid Hose Coupling. This full flow coupling is specially designed for handling liquid products under pressure and is available in special designs and metals to meet individual requirements.

An unusual feature of this coupling is the simple method by which the swivel nut is secured to the shank. A tie wire is built in to secure the swivel nut, thereby eliminating the cutting of expensive hose when replacing a worn nut. To replace the nut, simply cut open with hacksaw, spread and remove. Non-slip corrugated shank gives positive hose gripping area without injuring hose. Cast in flange prevents hose from interfering with swivel action; acts as cushion for hose end to rest upon, thereby eliminating any possibility of swivel action fraying hose fabric material. Available in 2″ size with a hex swivel nut and a 3″ size with a pin lug swivel nut.

For details, use **Key # LH-2** on Inquiry Card on page 1.

NEW OIL-GAS FILLER CANS

A line of completely redesigned galvanized oil and gasoline filler cans for mill, factory, and general industrial use has been introduced by Eagle Manufacturing Co. The cans feature a seamless-drawn

LIQUIDS HANDLING DEVELOPMENTS

dome-shape shell with double-seamed bottom, and no top or side seams. The dome-shape shell prevents water and dirt from settling on top. Heavy high-grade 26-gauge galvanized steel used in the cans provides for rough usage and unlimited service.

The new line of cans is available in 1, 2, 2½ and 5-gallon sizes. The company recommends the new-style oil and gasoline cans for filling stoves, heaters, in construction work, and general plant and railroad maintenance.

For details, use **Key # LH-3** on Inquiry Card on page 1.

ARRESTOR VENTS

A new arrestor vent for conserving volatile vapors and preventing flame flashback into storage tanks has been recently introduced by Black, Sivalls & Bryson, Inc. Available in 6, 8, 10 and 12-inch sizes, the new arrestor vent features improved flow capacity under both pressure and vacuum conditions; positive, floating type seal which holds tighter as pressure or vacuum increases up to dead weight setting (maximum pressure setting is 4 oz. and maximum vacuum setting is 2 oz.); easy disassembly by quick opening stainless V-clamps for inspection or maintenance; lightweight basic aluminum and stainless construction; compactness; and one-piece aluminum flame bank.

A new in-line flame arrestor, suitable for installation in a line or on a tank where free flow in either direction is desirable, has also been introduced including many of the same features as the arrestor vent. Capacity curves on both of these units are available upon request.

For details, use **Key # LH-4** on Inquiry Card on page 1.

CONTAINER FILLER PUMP

A newly designed, low-cost, lightweight hand pump, designed for dispensing petroleum products, and said to incorporate many features usually not found in far more expensive models, has been introduced by the Tokheim Corporation. Designated as the Model 476–15 Container Filler with spout, it is especially suitable for industrial use.

Flexibility and ease of handling keynote the many features inherent in the 476 Hand Pump. A non-drip shut-off is incorporated in the spout. The housing, of rugged, lightweight phenolic resin, is assembled by cadmium-plated snap-on clamps to speed service and prevent leakage. A separate, self-venting bung adapter and flexible synthetic suction hose simplify installation. The new unit pumps on both forward and back strokes, delivering approximately 12 gallons per minute. A vacuum breaker speeds drainage, and prevents loss by siphon.

The Container Filler Model is ideal for filling small hand vessels in industrial plants, or for transferring liquid petroleum to pails, which may be hung securely from the handy spout hook. Safety and efficiency of transfer are provided over the old-fashioned methods of hand pouring, or gravity drip, which too often lead to spillage, waste, accident and fire hazards.

For details, use **Key # LH-5** on Inquiry Card on page 1.

LIQUID COMBUSTIBLES INCINERATOR

A new industrial incinerator for smokeless disposal of combustible liquid waste materials has been made available by Prenco Products, Inc. Designated the Model SF-1 smoke-free industrial incinerator, the new unit is designed to handle liquid paint sludges, thinners, oils, solvents and any other combustible wastes that can be rendered to a liquid or slurry form. It is adaptable to any viscosity range between air-setting waxy compounds and gasoline.

The incinerator provides full combustion at temperatures in excess of 3000°F. with no ash in either the retort chamber or effluvia. The high operating temperature contributes to rapid burning rate and high efficiency. The new unit is an up-fired retort design,

providing inherent explosion relief characteristics through the top. Following initial start of the unit, operation is continuous and automatic and does not require operator attention.

The burner itself utilizes an air-jet principle requiring a supply of compressed air which is used both for atomization of the liquid waste fuel and for combustion. The burner is equipped with automatic "fail-safe" electronic shut down equipment.

For details, use **Key # LH-6** on Inquiry Card on page 1.

PORTABLE ACID PUMP

The Thompson Manufacturing Co. has introduced an acid pump that is power-driven and portable, designed to safely transfer acids from standard carboys and drums as well as from small, open, plating and storage tanks. Known as the Centri-F Acid Pump, it is driven by a totally enclosed, ¼ H.P., 115 V, 60 Cycle, 3450 RPM motor. The pump delivers a smooth, spurt-free flow of acid at the rate of approximately six gallons per minute.

Although designed to operate at floor level, the pump is said to operate at near full capacity under a six foot head of acid. The outside diameter of the intake tube is 1⅝", fitting the opening of almost any standard carboy and drum. The length of the intake tube, below the spout, is 23", which permits it to be inserted into a 13 gallon glass carboy, just short of striking the glass bottom. When used for open tanks, the pump is lowered into the tank as the level of the acid recedes. Additional sections of overflow tubing, complete with couplings, are available. The pump is constructed of stainless steel, teflon, and polyethylene.

For details, use **Key # LH-7** on Inquiry Card on page 1.

FLAMMABLE LIQUIDS DRUM FAUCET

An improved corrosion-resistant faucet, Model U-008, for dispensing corrosive and flammable fluids in the chemical, food, pharmaceutical and many other industries has been made available by Economy Faucet Co. The unit has been approved by The Factory Mutual Engineering Div. of Factory Mutual Laboratories.

Metal to metal contact has been eliminated in the stainless steel valve by the use of Kel-F fluorocarbon seal rings. In tests conducted by Factory Mutual Laboratories, the anti-flash screen prevented propagation of any flames entering the storage drum through the spout in the handling of flammable solvents. The self-closing faucet opens against coil spring pressure and insures positive shut

off when not manually held open. A guard prevents the faucet from being jammed in the open position. The faucet can be disassembled quickly for cleaning and can be chemically and/or steam sterilized.

For details, use **Key # LH-8** on Inquiry Card on page 1.

FIRE-RESIRTANT LUBRICANT

A synthetic lubricant for air compressors said to minimize explosions and receiver fires as well as carbon deposits on exhaust valves and air system piping has been announced by Monsanto Chemical Company's Organic Chemicals Division. Trademarked Pydraul AC, the lubricant is described by Monsanto as a fire-resistant fluid equivalent in lubricity to a premium grade lube oil. Similar in many of its properties to the company's other Pydraul fire-resistant fluids, it reportedly differs in its marked ability to reduce carbon deposition. Fires and explosions in compressed air systems are not uncommon and can be hazardous to personnel and very destructive to property. Although no single explanation exists for the cause of these occurrences, it is generally agreed that they involve combustible films or mists of petroleum-based lubricants or residues.

Pydraul AC is the result of many years of experimentation with synthetic lubricants by air compressor operators, particularly in petroleum refineries, gas pumping stations, power generating plants and other critical industries. It has been tested and proved in hundreds of such compressors by more than 30 major companies, the manufacturer states. Conversion of compressors from petroleum lubricants to Pydraul AC is reportedly simple. Splash-lubricated compressors need only be cleaned of their petroleum deposits before installing the new fluid. Separate force-feed cylinder lubricators can be converted with modification kits available from major lubricator manufacturers.

For details, use **Key # LH-9** on Inquiry Card on page 1.

SPRAY GUN RECEIVER

Clogging due to paint hardening in the nozzle of spray guns between operating periods is said to be prevented with the use of a spray gun receiver manufactured by the Protectoseal Co. Paint spray guns therefore are ready for instant use, regardless of the time lapse between operating periods; and the

annoying, time-consuming necessity of daily gun cleaning is claimed to be eliminated.

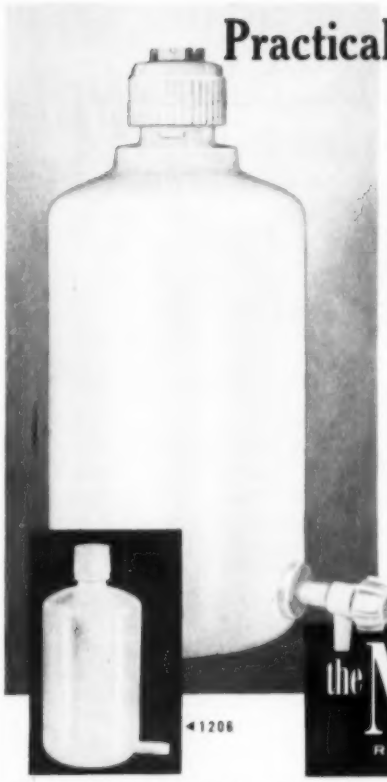
The new Protectoseal Paint Spray Gun Receiver keeps the nozzle tip of the spray gun in a solvent solution when not in actual use. The receiver is small, compact, with rounded corners, and may be located in the natural position normally used on the spray booth wall or bench. The gun is held securely in the receiver with hoses still attached, ready for use. A reservoir tank located well out of the way of the operator keeps a constant liquid level in the receiver. The perforated metal fire baffle in the gun port opening prevents ignition of the solvent in the spray gun receiver from exterior sources of ignition. Multiple gun receivers are also available.

Equally important in many paint spraying operations are the paint hose quick-connector receivers. Similar in principle to the spray gun receiver, these are made in various capacities to accommodate all the different color paint hose lines required at the spray booth. The receivers keep the paint hose quick-connector ends in solvent to prevent paint hardening at this critical point when not in use. The change from one paint line to another can be made quickly, and spraying continued with a minimum of delay.

For details, use **Key # LH-10** on Inquiry Card on page 1.

Back Strains of Hospital Employees

A new 16 mm training film, "Balance In Action," is designed to show hospital employees how to eliminate back strain. The subject is based on an idea suggested by Industrial Indemnity Corp. and Mt. Zion Hospital in San Francisco. The film has won an Award of Merit in the occupational group of the national contest sponsored by the National Committee on Films for Safety. It is available for preview and purchase from Franciscan Films, 1859 Powell St., San Francisco, Calif.



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Bridge this "danger period" with HAWS Emergency Eye-Wash Fountains that permit injured workers *instantaneously* to wash injurious matter from their eyes with clear water at safe *controlled pressure.*

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(For details, use Key # G-21 on card on page 1)

Maintenance–1957

The latest in the annual series of reports on the changing patterns of maintenance and engineering gives these subjects the greatest coverage in depth of the eight Volumes published. A report of the conference proceedings held annually in conjunction with the Plant Maintenance & Engineering Show, "Techniques of Plant Maintenance & Engineering–1957," this year includes 29 papers presented by discussion leaders, the largest number in the series thus far. In addition, the report on the discussion has 890 specific problems presented in the form of questions and answers.

It is available from the exposition management, Clapp & Poliak, Inc., 341 Madison Av., New York 17, N. Y. The price is $10 postpaid. The book contains 273 pages, each 8½ x 11", bound in cloth on board. Included are 46 charts, diagrams, tables and other illustrations.

Special Industry Studies

Although most of the papers have application to all industry, a number are devoted to specific industries. These include the maintenance problems of metal working plants, chemical plants, steel mills, metal fabricating plants, foundaries, paper mill and paper product plants, petroleum refineries, food processing plants, rubber mills and rubber product plants, and textile mills.

Subjects covered include "Changing Requirements for Maintenance," "Preventive Maintenance," "Maintenance Cost Controls," "Maintenance Shops," "Maintaining Mobile Handling Equipment," "Labor Relations Where Union Labor Is Employed," "Maintenance of Equipment Standards," "Preventive Maintenance of Power Distribution Equipment," "Role of Lubrication in Preventive Maintenance," "Organization," "Yardsticks by which to Measure Maintenance Effectiveness," "Training Maintenance and Engineering Personnel," "Maintenance in Small Plants," "Maintenance Welding," "Getting Maintenance People to Work as a Team," "Continuous Operation Plant," "Sanitation" and "Planning and Scheduling."

Radiation Effects

Publication of a new 120-page book on atomic radiation and its effects has been announced by E. C. Cahill, President, RCA Service Company, Inc. The book, "Atomic Radiation," discusses, in simplified terms, nuclear physics, observed biological effects of radiation, shielding methods, monitoring instruments, permissible radiation doses and medical evaluation of injuries and treatments.

Primarily designed for use by technicians and scientists engaged in nuclear power activities, it was originally prepared under contract for the United States Air Force which has approved reprinting and commercial sale.

"The understanding of radiation derived from a study of this manual," said Mr. Cahill, "will indicate to the worker his personal responsibilities in avoiding injury by observing safety precautions devised for his benefit."

While this timely publication is of vital interest to technical personnel, it will be of equal value to teachers, students, medical and civil defense workers, and the general public.

Postpaid copies are available from the Government Service Department, RCA Service Company, Inc., Camden 8, N. J. at $1.60 each. In quantities of ten or more, copies are $1.45 each.

Underground Corrosion

"Underground Corrosion," by Melvin Romanoff, National Bureau of Standards Circular 579, (227 pages, 103 illustrations, $3.00) can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

The corrosion of metallic structures buried in the ground or in contact with soil has long been a serious engineering and economic problem. There are in the United States almost 1 million miles of gas, water, and oil pipelines, 425,000 miles of railroad tracks, 170,000 miles of buried communications, signal, and power cable systems, as well as unknown numbers of other structures, such as tanks, pilings and burial vaults.

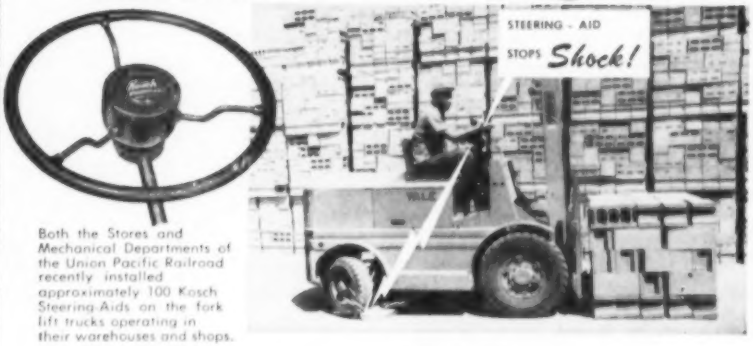
The annual loss to the American pipeline industry alone, from actual destruction by corrosion and the cost of preventing corrosion, is estimated to be in the order of 600 million dollars. In addition, a higher and undeterminable cost results indirectly from corrosion through the loss of products, shutdown of services, and loss of life and property by fire and explosion.

This circular which supersedes NBS Circular 450 issued in 1945, is a final report of the studies of underground corrosion conducted by the Bureau over a period of 45 years. Up to 1922, the studies were confined to corrosion due to stray-current electrolysis and its mitigation. After it became apparent that serious corrosion occurred in soils under conditions that precluded stray-currents as an explanation, a field burial program was initiated in order to obtain information per-

taining to the effect of soil properties on the corrosion of metals. Approximately 37,000 specimens, representing 333 varieties of ferrous, nonferrous, and protective coating materials, were exposed in 128 test locations throughout the United States. During this time the electrical and electrochemical aspects of underground corrosion, including cathodic protection, have been continuously studied in the laboratory. Results from both field and laboratory investigations are presented in the circular. Also included are many references to industrial investigations and field experiences related to the Bureau's underground corrosion investigations.

UNION PACIFIC RAILROAD CUTS WAREHOUSE ACCIDENTS WITH

SHOCK-PROOF Kosch Steering-Aid



Both the Stores and Mechanical Departments of the Union Pacific Railroad recently installed approximately 100 Kosch Steering-Aids on the fork lift trucks operating in their warehouses and shops.

SHOCKPROOF STEERING reduces accidents! Kosch Steering-Aid prevents road shocks from reaching the steering wheel and eliminates kickback. Operator has complete control, without danger of wheel-spinning. Steering-Aid holds guide wheels in the position they are set — even over rough ground and foreign objects. Automatic operation. Easy to install.

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(For details, use Key # G-22 on card on page 1)

Foundry Safety

Because new foundry processes have created new safety requirements, the American Foundrymen's Society, international technical society of the castings field, has issued a new manual . . . "Recommended Safety Practices for the Protection of Workers in Foundries," selling at $2.00 to AFS Members; $4.00 List.

This manual is a continuing effort of the society to help foundry management and technical people accomplish their collective goal of improving working conditions in the foundry industry. Published under direction of the AFS Safety, Hygiene and Air Pollution Control Program, the new manual was designed to meet two objectives: (1) to provide guides to making the foundry an even safer and better place to work; (2) to standardize safe practices in all foundries regardless of size.

The new manual is the third in the current series of three, the two previous ones being: "Air Pollution Manual," for meeting exterior requirements, and "Engineering Control for In-Plant Environment," for interior conditions guidance.

"Recommended Safety Practices for the Protection of Workers in Foundries" deals solely with aspects of industrial environment not contained in the previous manuals. It contains fundamental information relating to design, construction and application of safeguards; to personal protective devices for the prevention of injury; and methods of promoting good housekeeping. The safe practices recommended in the manual pertain to all branches of the metal castings industry.

Copies may be ordered from: American Foundrymen's Society, Golf & Wolf Roads, Des Plains, Ill.

Dust Explosions

Dusts of practically all combustible materials can produce violent explosions if the particles are suspended in air in certain variable concentrations and ignited. In an effort to reduce the hazard and frequency of such explosions, the National Fire Protection Association has published an 84-page "Report of Important Dust Explosions."

The report is in two parts: the first summarizes recent significant explosions of many of the more common dusts; and the second is a tabulation of causes, casualties and property damage of all dust explosions since 1860, as reported to the NFPA.

The NFPA fire record department compiled the report at the request of the Association's Committee on Dust Explosion Hazards.

In existence since 1922, the Committee has prepared and kept up to date 18 recommended codes which indicate necessary measures to secure reasonable safety to life and property from dust explosions. Each code deals with a different dust-hazardous operation.

All dust explosion codes are available as individual pamphlets (Pocket Editions of NFPA standards, 60 Series) and also in Volume II, National Fire Codes, published by the NFPA.

The newly released "Report of Important Dust Explosions" may be obtained from the NFPA publications department, 60 Batterymarch St., Boston, Mass. The book contains 84 pages; illustrated; cloth cover; single copy price $3.00 with discounts for quantity orders.

Fireproofing Fuel Tank

(from page 47)

simple, efficient and economical. It was machine-sprayed onto a paper-backed wire lath which had been attached to a Trussteel stud framework erected around the tanks.

This framework was connected only at the top of each tank and to runners circling the base. Thus the perlite concrete protection was built structurally independent from the metal tank exterior so as to provide a 1¾" dead air space. The insulating property of the perlite concrete barrier together with the dead air space is calculated as having an insulation value equivalent to that provided by more than three feet of structural concrete.

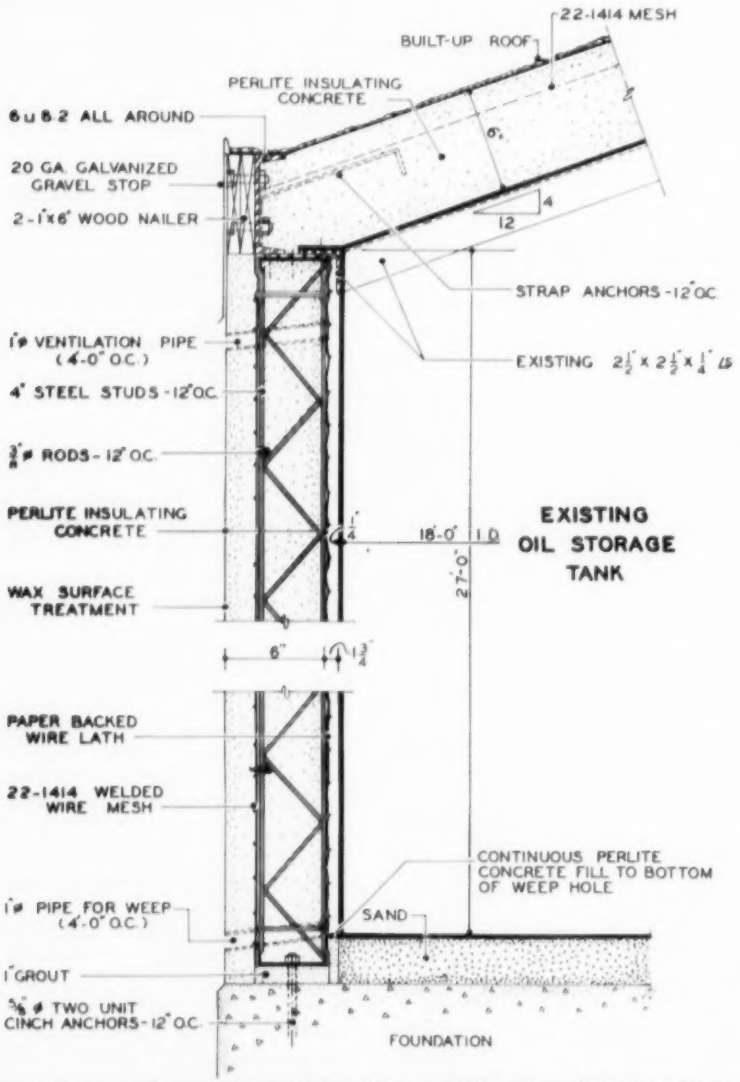
When completed, the perlite concrete was waterproofed. Tank tops were also protected with perlite concrete and then covered with four-ply membrane gravel roofs.

The composition of the concrete mix was as follows: 4 cubic feet of perlite to 1 bag of Portland cement, 5 lbs. Lumnite cement, 3 ounces of NVX air entraining agent (vinsol resin solution) and 62–64 lbs. of water.

Perlite concrete sprayed walls of this construction are approved for 4-hour retardant ratings. They may be applied by any experienced lathing and plastering contractor equipped with spraying equipment.

According to the plastering contractor on this project, concrete made with lightweight perlite aggregate was specified for fireproofing and insulation because of perlite's versatility and economy. Perlite, a volcanic rock that has been "popped" under heat like popcorn, is comprised of white, noncombustible cellular particles whose myriad tiny sealed air cells make it an excellent insulator.

The fire-retardant quality of perlite concrete is due, in part, to the fact that perlite concrete when exposed to fire releases chemically-combined water in the form of vapor. This action limits the temperature to 212°F. until all of the water has been driven off. Additionally, concrete made with perlite instead of heavy aggregate enjoys limited expansion at high temperatures. Consequently, there is a minimum of cracking upon exposure to flames, preventing fire from penetrating the concrete barrier.



Cross section of fireproofed fuel tanks. Total insulating value of perlite concrete and dead air space equals that of 3 feet of structural concrete.

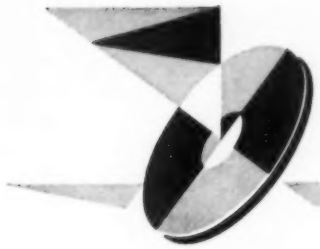
Pictures by courtesy of Perlite Institute.

Second Injury Funds

"Second Injury Funds," Bureau of Labor Standards Bulletin No. 190, discusses standards and patterns of second injury funds under State workmen's compensation laws. The report explains what a second injury fund is and how it promotes employment of the physically handicapped. It tells how, when, and where such legislation began. It discusses the benefits of such funds from the point of view of the disabled worker and from that of the employer.

The bulletin includes a comprehensive table giving the current status of second injury fund provisions under the workmen's compensation law of each of the 43 States now having such a fund. It will be of special interest to workmen's compensation administrators and to groups encouraging employment of the physically handicapped, as well as to workers and employers generally.

Copies may be obtained free of charge so long as the supply lasts from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C., or from Dept. of Labor offices in Boston, New York, Chicago, San Francisco, and Atlanta.



transportation safety

Safety Belts Save Lives

Representatives of the Cornell University Committee on Transportation Safety Research have told a Congressional committee investigating traffic accidents that a university study of automobile accidents has proved "beyond all reasonable doubt," that automobile seat safety belts save lives and reduce the frequency—and the severity—of injuries to drivers and passengers involved in accidents.

John O. Moore, director of the University's Automotive Crash Injury Research division, said that research on the design and installation of auto seat belts has been carried on for more than 10 years in a series of projects at the Cornell Aeronautical Laboratory, under the direction of Edward R. Dye, head of the lab's Safety Design Research Department.

Mr. Moore said that for the past two years the ACIR group has checked the effectiveness of seat belts by investigation of actual traffic accidents.

"From more than 5,000 case histories of injury-producing accidents," Mr. Moore said, "we have reached conclusions which should remove all doubt of the effectiveness of safety belts in minimizing injuries in automobile accidents. In actual use, properly designed and installed seat belts will increase a car occupant's chances of escaping injury in an accident by nearly 60 percent."

One of the obvious reasons for the success of safety belts, Mr. Moore said, is the protection they afford by keeping passengers inside a car in accidents in which car doors fly open. Study has shown that front doors open in 50 percent of all accidents involving cars manufactured prior to 1956, and passenger ejection is the second most important cause of injury in automobile accidents. Similarly, it is one that is almost completely eliminated by the use of properly engineered and installed safety belts. Even in non-ejection accidents, safety belts tend to lessen the frequency and severity of injuries by "packaging" the driver and passengers.

The Cornell announcement comes at a time when claims and counter-claims about the value of safety belts are being made by many widely varied groups and individuals. Such claims, Mr. Moore said, are usually based on isolated cases or on "test" crashes in which, by use of dummies, an effort is made to judge the injury-producing potential of accidents. The reliability of these methods, he pointed out, contrasts markedly with Cornell's investigation of actual accident cases, in which basic data is provided by specially organized and trained teams of police and highway patrol officers, who investigate the accidents, and by the physicians who attend the accident victims. It has been recorded on punch cards, compiled and analyzed by experienced analysts and their findings have been thoroughly checked for accuracy.

Case Histories

Mr. Moore said that in evaluating the effectiveness of safety belts, ACIR analysts sifted through more than 5,000 file cases and established a control group and an experimental group in which accidents in both groups were kept as nearly identical as possible.

"The only difference," he said, "was that cars in the control group were not equipped with safety belts, while in the experimental group, safety belts were in use at the time of the accident."

The ten points on which accidents in both groups had to agree were these: type of accident; area of principal impact; direction of principal force; speed at impact; frequency of doors opening; number of cars per accident; make; weight; year of manufacture of the case car; and the seated area of car occupants.

With these accident factors identical, ACIR staff members isolated 162 matched cases in which the only appreciable difference in the circumstances of a control case and its matching experimental case was the use of seat safety belts. It was then possible to compare the number of injuries and their severity in each of the two groups and thus determine the extent to which safety belts had lessened the anatomical and physiological damage caused by motor vehicle crashes.

Result No Surprise

Mr. Moore said that while this is the first real proof the nation has had of the degree of effectiveness of automobile safety belts, the knowledge comes as no surprise. It bears out similar studies undertaken several years ago by another Cornell Medical College research group investigating the protection afforded air travellers by safety belts in aircraft. The findings of the air study group did much to foster and standardize the use of airplane safety belts. The ACIR project actually evolved from the air study and is charged with the task of discovering just what happens to the human body in automobile collisions.

Research under Mr. Dye at the Cornell Aeronautical Laboratory in Buffalo has been under way for the past ten years. In those laboratory studies dummies were used to simulate the reactions of the human body in crashes with and without the seat belt; there have been structural tests of various belts and of

various types of anchorage to the vehicle. These studies led to estimates, now shown to have been conservative, that proper use of seat belts would reduce injury and death by as much as 50%.

In May of 1954, the Cornell University Committee for Transportation Safety Research, of which Dr. T. P. Wright, Cornell vice president, is chairman, adopted a resolution which recommended seat belts as effective devices for increasing passenger protection in automobiles.

Aside from its medical value, the data gathered by the ACIR group is providing factual information to people engaged in many areas of automotive design and of accident prevention work who formerly had to rely solely on conjecture. In this vein, Mr. Moore said that ACIR is now completing a study of what effect the safety devices included on most 1956 model cars have had on injury incidence and severity. The group hopes to announce the results of this study in the near future, he said.

In the meantime, Mr. Moore cautioned motorists interested in installing safety belts on their cars to beware of many belts now flooding the market which are being produced primarily for their cheapness rather than for the protection they afford.

"To be effective," he said, "an automobile safety belt should meet the standards established by the Society of Automotive Engineers and must be properly installed. This requires secure anchoring to the basic structure of the car and should be performed by an experienced person. Finally, the best belt in the world is of no value unless it is used each time the car is put in motion. However, we are now sure that when these three conditions are met, a passenger's chances of escaping death or serious injury in an accident are vastly improved."

Driver Vision

In a special report, Carl S. Hallauer, president of the Bausch & Lomb Optical Co., calls for a five-pronged attack on the problem of inadequate vision on the nation's highways.

The report declares that "the data on motorists' vision, when you consider all their implications, represent a shocking situation. They mean that there is literally murder in the eyes of many of the motorists on our streets and highways today."

Declaring "There is a general recognition of the inadequacy of most of our present vision testing and re-testing procedures incident to the issuance of licenses to automobile drivers," Hallauer calls for these remedial steps:

1. Modernization and standardization of vision testing procedures from state to state.

2. Acceleration of driver vision research to establish new and higher standards for driver licensing.

3. In the meantime, upgrading of all driver vision to meet existing standards of the states which are most exacting in their qualifications.

4. A nationwide educational campaign seeking corrective legislation in the individual states.

5. Voluntary eye examinations by all autoists taking to the highways.

"If poor vision accounted for only 5 percent of the nation's annual traffic toll, and this factor could be eliminated, it would mean a saving of 2,000 lives, 70,000 injuries, and $237,500,000 a year," Hallauer adds.

Among the wide variations from state to state on just what visual ability should be required of autoists, Hallauer cites the following:

"The acuity standard ranges from 20/30 to 20/70—even to no vision test at all. Only 18 states test for depth perception, and 39 for color blindness. Only 10 states test for visual field—how much one can see to the sides while looking straight ahead—and among these 10, the range is from 90 degrees to 150 degrees. Consider how important this is when children run out into the street and vehicles dart out at intersections!"

Hallauer also points out that with the exception of a few states, there is no re-examination of drivers as to their vision or other factors important in driving—"and it is a physical fact that vision almost always deteriorates with age, and needs more advanced correction as the years go by. Regardless of this,

(Continued on page 58)

Lighting Demonstration

A demonstration roadway lighting facility where more than 30 different lighting combinations can be observed has been unveiled at General Electric's Outdoor Lighting Department. Although the demonstration streets measure less than one-third of a mile in total length, they offer opportunities for showing the effects of virtually every combination of modern lighting that can currently be applied to roadways.

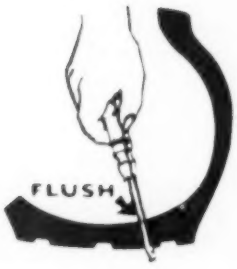
The area at Hendersonville, N. C., is designed to provide practical demonstrations of all types of street lighting equipment on different types of pavement and on all major street classifications. Here users of street lighting equipment—municipal officials, state highway representatives, electric utility lighting engineers, and others—can compare and evaluate different light sources for a variety of applications.

General Electric will use this facility to conduct extensive studies, investigations, and research on how well the night driver actually sees under various roadway lighting systems. The area will also serve as a proving ground similar to those used by automobile manufacturers in that it will aid the company in developing improved equipment to help reduce night hazards for motorists and pedestrians.

A master control panel enables an operator to make rapid changes of lighting setups so viewers may compare effects of all three major light sources—filament, mercury, and fluorescent—on streets similar to those found in any community. Comparisons can be made of effects created by the newest, most modern luminaires and older lighting fixtures still in use.

Provision has been made for testing the effect of all three major light sources on residential streets, traffic streets, main business streets, and whiteways varying in width from 25 to 70 feet. More than 130 luminaires of 15 different types are mounted on steel, aluminum, concrete and wood with a variety of brackets. Both overhead and underground wiring is used and multiple and series circuit is demonstrated. Included is parallel-to-roadway fluorescent street lighting —an experimental new system.

for either vulcanizing method . . . do this



1. Mark Puncture Hole & Insert Threading Tool

2. Buff Thoroughly

3. Thread Filler Rubber

How to Repair Tubeless Tires

By **B. S. BYALL**, Manager of Sales
The Dill Manufacturing Company
Cleveland, Ohio

With millions of tubeless tires now in use on American highways, the problem of their servicing is becoming increasingly important to service stations, garages and fleet maintenance shops.

Comparatively little information has been published on the servicing of tubeless tires, principally because of their recent introduction. However, by the very nature of their design, which differs sharply from conventional tires, certain factors must be considered in their repair.

Puncture Repair

Naturally, the most often encountered servicing job on any tire is that of repairing punctures. With a conventional tire, where the tube itself is repaired, the problem is not as severe since the patched tube, when inflated, is securely held against the tire to reinforce the basic strength of the patch itself.

With tubeless tires, however, the repair job assumes even greater importance, first because the patch must withstand the continued stress of the rolling tire without support from a tube; and second, because of the cost of such tires.

It is most important to remember that the repairing of tubeless tire punctures is simple and easy when proper methods are followed, since experience has proven that most repair failures have been due to so-called "short-cut" methods.

In general, the basic considerations of tubeless tire puncture repair are:

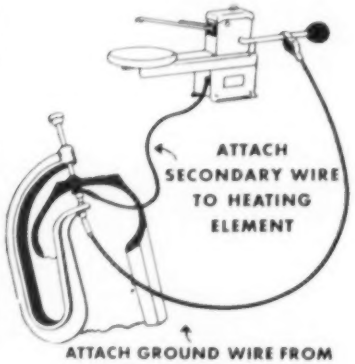
1. The puncture hole must be completely and permanently sealed, and
2. The repair must include reinforcement on the inside of the tire so that interior air pressure and road shocks and flexing will not cause the repair to break away and be blown out of the tire.

Most tire manufacturers and oil companies, after thoroughly testing various repair methods, insist that tubeless tires should always be vulcanized.

With vulcanizing, it is important to use a filler material in addition to the vulcanizing patch. The reason is that tubeless tires in normal

And in Addition . . .

For Electric Vulcanizing Do This



For Chemical Vulcanizing Do This

Pour a few drops of vulcanizing fluid over the center of the buffed area. Leave only a thin coating of fluid to dry.

Allow Fluid to Set at Least **3 Minutes** Before applying patch

Center patch directly over puncture and roll patch thoroughly. Make certain all air pockets are worked out.

For This Type of Finished Job

operation flex greatly, and this, plus natural "breathing," creates a suction. On wet and oily surfaces, moisture is thus absorbed through the puncture hole, which in time will weaken and eventually cause deterioration of the fabric liner and the tire itself.

For perfect puncture repair of a tubeless tire, therefore, a combination of filler material plus a vulcanizing patch will prevent the problem of moisture absorption and will provide maximum safety and insure the investment in the tubeless tires.

With this in mind, what then are the steps to be taken in obtaining the best possible servicing job with tubeless tire punctures?

Buffing Is Most Important

Thorough cleaning and buffing of the inside tire area around the puncture is vitally important. Extreme care should be taken to see that this area is completely clean and roughened to assure adhesion of the patch to the tire. Many tubeless tires have a heavy coating of graphite, mica and soap lubricants which will prevent patch adhesion unless completely removed by cleaning and buffing.

At the same time, of course, care should be exercised not to buff through the liner and thus damage the fabric wall.

Prior to the vulacanizing operation, certain basic steps are required.

First, the puncture hole should be located and plainly marked inside and out with a grease crayon. Next, a dependable tire spreader should be used to hold open the casing. In this connection, it should be noted that the advantages of a tire spreader more than compensate for the small initial cost, in terms of time and effort saved on the part of servicing personnel.

With the tire in position, a threading tool is next inserted through the puncture hole. The handle of the tool is then removed and used to push the needle portion of the tool into the hole until its base is flush with the liner. After buffing, (buffing is recommended after the needle is in position to prevent losing the hole) a strip of filler rubber, which is included with the vulcanizing patches, is inserted into the needle. A strip, approximately ⅛" wide, is used.

Finally, the needle is pulled through the tire, leaving the filler rubber in the puncture. Excess rubber is then trimmed away with the remainder tucked into the puncture hole.

While the foregoing steps are required prior to any vulcanizing process, two most popular subsequent vulcanizing methods may be utilized. The first, the electric method has long been used with exceptional results. The second, a chemical vulcanizing process is a more recent introduction.

With the first method, specially designed patches are used in combination with a "U"" clamp.

A patch, which is supplied already mounted on a small metal plate, is affixed to the heating element on the "U" clamp which, in turn, is inserted into the tire directly over the puncture area.

After the pressure screw is turned to hold the patch securely in place, secondary and ground wires are attached to the pressure clamp for current.

It is important to note that with electric vulcanization, the patch and filler rubber first heats, then melts and flows completely into a perfect core. The process is accomplished as the heat builds up to 330°F., and it is this build-up, rather than a quick surge of heat, that gives the excellent results.

When the repair reaches the required 330°, a fusible plug on the patch plate softens sufficiently to break the circuit to cut off the current automatically. The operation consumes only about six minutes. It is suggested that best results are obtained if the patch is allowed to cool a minute or two before removing.

The advantages of this method of vulcanizing include the automatic repairing of tires without guesswork. A perfect job is guaranteed each time, even though the attendant may walk away to attend to other business. For maximum convenience, a buzzer sounds the entire time the current is on, so that when the buzzer shuts off, the operator knows the job is done.

A second method of vulcanizing involves the use of chemicals. After the puncture hole has been marked and buffed thoroughly, and the filler material added, a few drops of vulcanizing fluid are poured over the center of the buffed area.

The fluid is then evenly spread over the area, working from the center to the outside. It is particularly important that only a thin coating of fluid is left to dry.

After the fluid is allowed to set at least three minutes, and this waiting period must be allowed under all circumstances, the patch is ready for application. The patch is centered directly over the puncture and rolled thoroughly using a stitcher which is attached to the threading tool handle. It is important that all air pockets are worked out of the patch.

To understand the principle of chemical vulcanizing, it should be remembered that the chemical process which provides a secure bond occurs only when the agent in the fluid and the second agent in the tube and tire come in contact. Then, and only then, does the proper chemical reaction take place.

Without question, vulcanizing, either by electric or chemical methods, is the one sure answer to tubeless tire puncture repair. By utilizing the vulcanizing process, fast, sure and economical servicing is possible to guarantee against the reopening of a puncture under driving stress and strain.

Pictures by courtesy of Dill Mfg. Co.

Driver Vision

(from page 56)

once a licensed driver, always a licensed driver—with rare exceptions—no matter how much his vision has deteriorated."

"Paramount in the physical equipment demanded for today's driving are the driver's eyes. It is the one faculty without which he cannot possibly handle an automobile. Lacking almost any other, the driver is able to pilot a car, but no one has yet designed an automobile which can be handled by a driver who cannot see. Every turn of the steering wheel, every application of the brake or gas pedal has to be determined by the driver's vision."

The report estimates that 90 per cent of driving decisions are based on sight.

Howard E. Eldridge has been elected vice president in charge of sales and a director of *JOMAC INC.*, Philadelphia.

Eldridge joined Jomac in 1948. Previously he had been a production manager for National Gypsum Company, vice president and sales manager for F. W. Bear, Inc., and sales representative for Procter & Gamble Company. Jomac manufactures work gloves, laundry cloth, and products for the graphic arts industry.

James H. Childs, Jr., president of *H. CHILDS & CO.*, has announced the appointment of *Albert J. Belasco* to the *Iron Age Safety Shoe* sales staff. His territory will include sections of Eastern Ohio, Western Pennsylvania and Northern West Virginia.

Mr. Belasco has been with the Iron Age Safety Shoe Division for many years, serving in various capacities in the home office; most recently as head of the Iron Age order department.

PURITAN CHEMICAL COMPANY, manufactuer of sanitary and building maintenance products, has established a new sales office and warehouse in Houston, Texas, *Ted V. Fisher*, vice president-marketing, has announced. The new Houston warehouse is located at 816 Live Oak Street, will support Puritan's plans to expand throughout the Southwest.

William L. Eubanks, Jr., is the company's district sales manager at Houston, and *W. R. Hine, Jr.*, formerly assistant plant manager at Puritan's home plant at Atlanta, Georgia, has been promoted to manager of the Houston warehouse.

CLARKE SANDING MACHINE COMPANY, Muskegon, Michigan, manufacturer of floor maintenance equipment, has announced that two new officers were elected at the company's annual stockholders' meeting.

Fred G. Cooper, former Secretary of the company, was elected Vice President and *H. L. Croskey*, Clarke General Sales Manager, was elected Secretary.

W. A. Lunger became President of *OHIO CHEMICAL & SURGICAL EQUIPMENT CO.*, a Division of *Air Reduction Company, Inc.*, on July 1, 1957 it was announced by *John A. Hill*, President of Air Reduction Company, Inc. He succeeds *R. E. Lenhard* who was promoted on the same date to Executive Vice President of Air Reduction Sales Company.

Mr. Lunger, recently Vice President of Ohio Chemical, has been associated with the Company for the past eighteen years. Under the new organizational setup, *J. M. Cotter* will be Vice President. *C. A. Simpler* was previously appointed General Sales Manager of Ohio Chemical with headquarters in Madison, Wisconsin. He started with the Company in 1935, and formerly held the position of Midwestern Regional Manager with headquarters at Chicago. *L. E. Guentz* is promoted to Midwestern Regional Manager. *J. H. Greer*, formerly a sales representative in the Chicago and Louisville areas, was appointed Assistant Sales Manager of the Midwestern Region.

Thomas Stanton has been named general sales manager of *PRETTY PRODUCTS, INC.*, Coshocton, Ohio, it was announced by *William D. Timmons, Sr.*, president of the company.

Mr. Stanton, before coming to Pretty Products, was associated with the *Edmont Glove Company*. Pretty Products is the manufacturer of industrial gloves, rubber housewares, and several lines of household gloves and bathing caps.

Word has been received of the death on May 23 of *Norbert Tamandl*, office manager and purchasing agent of *ACME PROTECTION EQUIPMENT COMPANY*.

Mr. Tamandl entered the safety industry with the *E. D. Bullard Company* in Chicago, where he advanced from stock clerk to office manager. When the Acme Protection Equipment Company changed management in 1946, he joined the new organization with *G. M. Glidden* and *R. A. Flood*, and has been office manager of the company ever since.

When Acme moved from Chicago to South Haven, Mr. Tamandl moved with his family and they became an active part of the community life. He is survived by his wife and three children.

Mr. Robert A. Flood is assuming the duties of purchasing agent for the company.

A new *DOW CORNING* plant for manufacturing silicone consumer products is being built at Greensboro, N. C., it

★ THE POSITIVE LADDER SAFETY DEVICE

Locks AUTOMATICALLY & instantly-holds

Prevents death and injuries from falling.

Automatic: Positive. Will catch workman if he starts to fall even if unconscious.

Inexpensive. Easy to install. No upkeep. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting. **Simple to operate:** Requires no attention from climber.

Notched rail **hot dipped galvanized.** Entire equipment rust and corrosion proof.

Can be kept free of ice by applying heat inside carrier rail.

In use approx. 9 years. Approved by Safety Engineers and Govt. Agcys. throughout country. Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd., P. O. Box 1052
BURBANK, CALIFORNIA

(Use Key # G-23 on Inquiry Card on page 1)

For Safety
Guardi-Ann Hat

Combines utmost protection and style. Exclusive patented features found in no other hat.

Write for Free Sample or Order Direct from us

$15.00 dz.

CHIC MAID HAT MFG. CO., Inc.
630 HIGH STREET
BUFFALO 11, N. Y.

(Use Key # G-24 on Inquiry Card on page 1)

was announced by *Dr. W. R. Collings*, president of the Corporation. At the same time he announced the establishment of the Silicone Specialties Division as a separate operating unit.

The move will consolidate the division's manufacturing in a location permitting more efficient operation and providing room for diversification and expansion of this line of Dow Corning silicone products. Some technical personnel will be transferred to Greensboro later. Sales and administration offices of the Silicone Specialties Division will remain at the home offices in Midland, Michigan. Silicone products to be made in the new plant include lens tissues, shoe water-proofing compounds and automotive sealing compounds.

SAWYER TOWER, INC. has announced the appointment of *J. Bruce Ayer* as Zone Representative in the Chicago area. Formerly a member of the company's home office sales organization in Boston, Mr. Ayer's address is 2016½ Sherman Ave., Apt. D-1, Evanston, Ill. He will service distributor outlets on the technical phases of protective clothing in the states of Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota and South Dakota.

LEXSUCO, INC., national roofing engineering firm and distributors of fire-retardant roof constructions, has announced the appointment of *Frank W. Curtis* as president. Formerly Vice President and General Manager, Mr. Curtis joined the eleven-year-old engineering firm in 1952. A 1939 graduate of Yale University, he was associated with the Aluminum Company of America prior to joining Lexsuco.

JOHN H. BRECK, INC., was recently presented with the "Key of Achievement" Award by the Student Market Institute at the fourth Annual Student Market Clinic held in New York City. Robert M. Stelzer, President of the Institute, when presenting the award to *Edward J. Breck*, President of John H. Breck, Inc., stated that it was in recognition of that firm's outstanding youth-and-educational advertising and promotion programs.

Paul F. Bauder and *A. Frank Garbarino* have been promoted to new posts in the Marketing Division of *LEWIS-SHEPARD PRODUCTS, INC.*, Watertown, Mass., it has been announced by *Arthur L. Lewis*, President.

Previously Sales Manager for Hand Lift Trucks and Stackers, Mr. Bauder becomes Assistant General Sales Manager. His new assignment involves both sales and administrative duties on the entire Lewis-Shepard line of electric fork trucks and related materials handling equipment.

Mr. Garbarino, named Division Sales Manager for Hand Equipment, was formerly Sales Manager for Floor Trucks and Skids. In his new post, he is responsible for sales of all L-S hand equipment. Included are hand life trucks, stackers, floor trucks, skid platforms, racks and additional hand-operated equipment.

J. S. McKindsey

Richard H. Krause, President of the *SAFETY FIRST SHOE CO., INC.* of Holliston, Mass., manufacturers of industrial safety shoes, announces the appointment of *J. S. McKindsey* of Winchester, Mass., as Vice-President of the company. McKindsey was formerly Sales Manager of the *Tillsonburg Shoe*, manufacturers of Safety Shoes at Tillsonburg, Ontario, Canada; also Sales Manager of the *Gro-Cord Rubber Co.*, Lima, Ohio, and latterly in charge of the Industrial Safety Sole division of the *American Biltrite Rubber Co.*, Chelsea, Mass.

THE PIONEER RUBBER COMPANY of Willard, Ohio has announced the appointment of *Charles M. Allen* as its southeastern area representative for its Industrial Products Division. He will handle the entire line of industrial gloves made by Pioneer. Mr. Allen's area of activity will include Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee, Virginia and part of Kentucky.

THE HAMMEL-DAHL COMPANY, of Providence, R. I., manufacturers of automatic control equipment, announce the appointment of *William R. Kennedy* as Assistant Sales Manager. Previous associations include the Max B. Miller & Company, as Assistant Project Engineer, and the Mason-Nielan Company as their European Sales Manager and later, as their New York District Sales Manager.

H. W. Dauber has been named manager of marketing services for the Mining and International Divisions of *MINE SAFETY APPLIANCES COMPANY*, Pittsburgh, it was announced by *C. M. Donahue*, vice president of the firm. Mr. Dauber was formerly assistant to the manager of the mining department. In his new position, he will be responsible for advertising, sales promotion, and market research for both divisions.

Safety Appointments

Eliot V. Parker, who developed the first safety programs for the War Department during World War II, has been appointed Safety Director of the First United States Army. Mr. Henry M. Ferguson, Acting Safety Director, and since 1942, the chief Safety Administrator on Governors Island, will continue as assistant to Mr. Parker.

The new Safety Director was for some time a safety engineer with The Travelers Insurance Company, and in April 1941 was loaned by the Company to the Office of The Quartermaster General in Washington, D. C., to establish the first War Department Plant Protection program.

In May 1942 he established and supervised the first safety program put into effect by the War Department and served until 1946 as War Department Safety Director, attaining the rank of lieutenant colonel. From April 1946 until March 1955 he was named the first Safety Director of the United States Army. He then transferred to the U. S. Department of Labor as Chief of the Division of State Safety Standards and Services, resigning last December.

Annual Connecticut Safety Conference

The Twelfth Annual Connecticut Industrial Safety Conference, sponsored by the Connecticut Safety Society, was attended by 500 person on June 4 and 5 in New Haven. Emphasizing the importance of safe working conditions and safe working practices, the two-day conference featured discussions and demonstrations covering various angles of industrial hazards and their control.

Prominent speakers, noted throughout the country for their accomplishments in the industrial safety field, conducted sessions on such topics as noise hazards, traffic safety, safe plant conditions, and management's place in the industrial safety program.

A demonstration presented by the United States Bureau of Mines covered the basics of fire safety, characteristics of flammables, and static electricity. In addition to the general sessions, there was an array of 38 safety exhibits sponsored by leading manufacturers in the field.

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by SAFETY MAINTENANCE.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., SAFETY MAINTENANCE.

what's new for AUGUST

BURN SPRAY

(Use Key # 906 on Inquiry Card on page 1)

BURN-QUEL has been designed to provide adequate relief for treating burns and scalds through the medium of an effective spray.

The active ingredients of this spray are oils which are said to be most highly effective for burn treatment. Although the growth of new tissue is vitally important, the immediate relief of pain should never be disregarded and Burn-Quel excels in both departments, according to the manufacturer, A. E. Halperin Co.

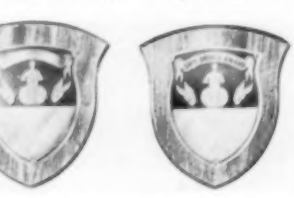
Packed in an attractive 2 oz., non-breakable aerosol container, Burn-Quel easily fits any size hand and is ready for immediate application. The medication is water soluble for ease in removing.

SAFE DRIVING & RODEO PLAQUE

(Use Key # 907 on Inquiry Card on page 1)

AN entirely new design of Safe Driver and Truck Roadeo Plaque is announced by Williams Jewelry & Manufacturing Company. The ribbon at the top of the metal plaque is available either with the words "SAFE DRIVER AWARD" or plain so that the purchaser may have his own inscription engraved. The plaque is constructed of two-tone Jewelers' Bronze etching on a genuine walnut shield. The shield is 7½" x 1¼".

The new Plaque is designed for awarding to the Safe Driver-of-the-Month or to the winner of a Truck Roadeo or as a prize for a company's safety contest. It is one of the company's wide line of trophies and awards, emblems and plaques. Write for the free 36-page catalog No. 5154.



VERSATILE LINE MARKER

(Use Key # 908 on Inquiry Card on page 1)

A NEW marking machine which employs a Dynel paint roller now makes it possible to lay safety and parking lines up to ½ inch of any barrier. It will also continue the line vertically by rolling up a curb, pillar or a wall with ease. Called the Roll-On, it is the newest of the Florline marking machines, made by H. C. Sweet Co.

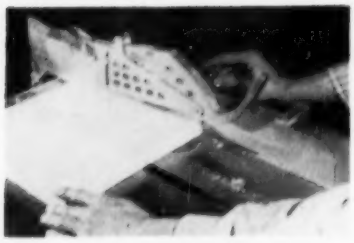
The Roll-On eliminates hand-painting to finish horizontal lines which, with conventional equipment, would end short of a barrier. It also assures automatic, quickly applied vertical lines where these are required in plants, on streets and other areas. Vertical lines remain visible when lines on floor or pavement sometimes become covered or worn.

The unit will paint smooth, even lines with a neat square-edge under many different surface conditions. The roller comes in standard 4, 3 or 2-inch widths. A unique design allows the paint to feed directly onto the roller from above through multiple brass valves. The flow is controlled by operator pressure on a trigger handle. It is electric driven and is said to present no fire hazard.

AUTOMATIC THREE-LAMP EMERGENCY LIGHT

(Use Key # 909 on Inquiry Card on page 1)

A SELF-CONTAINED "Sentry-Lite," Model 300X, is fully automatic for emergency use in large areas. This lighting unit is topped by three 5,000 candle-power sealed-beam lamps which will provide illumination for six hours. It features an automatic recharger operating on standard electrical power to keep the battery up to peak capacity. Test panel in front includes a momentary switch for test as to function, AC fuse, toggle switch to cut off light, and pilot light to indicate unit is functioning. Over-all dimensions: 8 x 10 x 13 inches. Available from American Optical Co.



SAW SAFETY PUSHER

(Use Key # 910 on Inquiry Card on page 1)

THIS is a safe feeding device that eliminates most of the dangers in operating table saws. The unit consists of a rip saw fence with a built-in pusher. There is no need to touch the piece of stock while the saw is in use, because all feeding can be done with the knob on top of the fence.

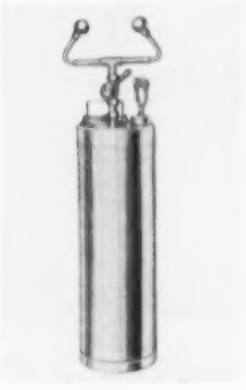
The pusher element is made up of the knob (projecting above the fence) which is connected to a brad point (extending from the base of the safety fence) which contacts the stock for feeding and moves in a clear track. The device is called "Safety Charlie," is made of extruded aluminum by Central City Machine & Tool Co. It can be attached to all existing saw fences instantly without tools of any kind. It will feed and follow the piece through the cutting area regardless of the type of barrier used and with the operator's hands out of the danger zone.

PORTABLE EMERGENCY EYE-WASH FOUNTAIN

(Use Key # 911 on Inquiry Card on page 1)

A PORTABLE emergency eye-wash fountain, for instant eye first-aid where normal water supplies are unavailable, is now manufactured by Haws Drinking Faucet Company. This new product, Model 8950, is the latest addition to Haws' line of emergency facilities which includes eye and face wash fountains, drench showers and numerous model variations. It is designed for use by construction crews, chemical crews—any group working in remote areas where water is not available.

The corrosion-proof stainless steel tank is complete with handy carrying strap, and holds three gallons of water instantly ready to flood the eyes and wash away dangerous substances or particles. Specially designed fountain heads project water into the eyes, with a soft flushing stream. Pressure is built up within the tank by means of the large pump handle. This pressure is maintained for *an 8 hour day*. Model 8950 weighs approximately 40 lbs. when filled with water. Its empty shipping weight is 15 lbs.



HEAD SNUGGERS

(Use Key # 912 on Inquiry Card on page 1)

HEAD Snuggers, as liners for safety hard hats, provide necessary protection against winter winds and cold. Manufactured by Kennedy-Ingalls, Inc., they are proportioned to the complete range of head sizes and designed to fit close to the forehead, face, and neck thereby sealing out winds.

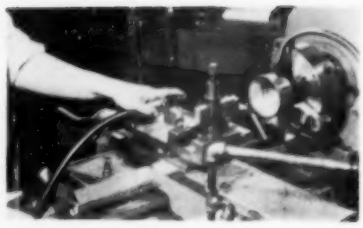
The standard No. WC-7 model is made of double thicknesses of material to insure warmth and is completely washable and reusable. Also available are other styles including a flame-retardant, water-repellent model for welders; a coated fabric model for workers exposed to wet weather; and a special model with non-metallic fasteners for use by electrical linemen.

Full coverage styles have a wide chin-strap with an adjustable quick release buckle, also fasteners for installation in all popular makes of hard hats.

DELUXE DUNKING STATION

(Use Key # 913 on Inquiry Card on page 1)

THE ADDITION of a Deluxe Model to its line of cigarette dunking stations has been announced by Standard Industrial Products Co. The new model is available in both Standard and Jumbo sizes. Featuring smooth, brightly polished canisters, the Deluxe models should fit well into the decor of modern offices, waiting rooms, hospitals, first aid rooms, lobbies, shops, cafeterias, and other public rooms.



MAGNETIC NOZZLE HOLDER

(Use Key # 914 on Inquiry Card on page 1)

A MAGNETIC air-hose nozzle holder, which clamps to machine tools at the point of use, has been developed by The Dilley Manufacturing Co. The new product saves time of machine tool operators in clearing away cuttings, and reduces accident hazards created by air hoses that dangle from overhead hooks or writhe on shop floors.

Marketed under the name of Dilley Magnetic Nozzle Holder, the device consists of a pliable rubber nozzle fastened to lifetime Alnico magnets of 110-pound or 35-pound pulling power. Slight, one-finger pressure starts the flow of air through the nozzle, and air is shut off as pressure is released. The holder remains firmly anchored in the most convenient position when in use, but can be moved and clamped to any part of the machine if desired. The device also can be adapted to position coolant tubes and paint spray nozzles. Use of the holder also permits shorter air hoses, which can stretch directly from the air line to the machine without allowing exra length for looping over hooks or wires.

APPLICATOR PACKET FOR POISON IVY OINTMENT

(Use Key # 915 on Inquiry Card on page 1)

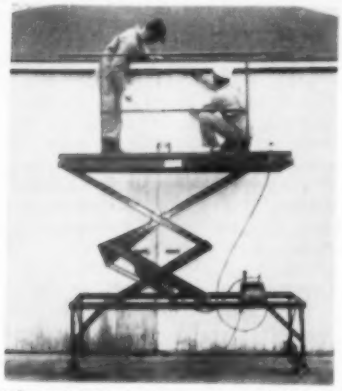
OUTDOOR workers are provided quick relief from poison plant irritation with individual poison ivy ointment packets introduced by Medical Supply Company. The company's No. A-17 poison ivy ointment is now being packed in individual foil envelopes for quick, on-the-spot treatment.

To apply the ointment directly to the affected area, the worker simply squeezes the foil envelope after first tearing off one corner. Quick, on-the-spot treatment before the toxic agent has a chance to spread, helps to localize the irritation. The ointment is effective as either a preventive or a cure. Six 3.1-gram individual foil envelopes of the A-17 poison ivy ointment are included in unit packages, properly sized for unit system first aid kits.

HYDRAULIC SCAFFOLD

(Use Key # 916 on Inquiry Card on page 1)

A NEW portable hydraulic scaffold manufactured by Grell Enterprises for building contractors, masonry contractors, interior decorators, painters, electricians and indus-



trial maintenance is announced by the marketers, Adam Company.

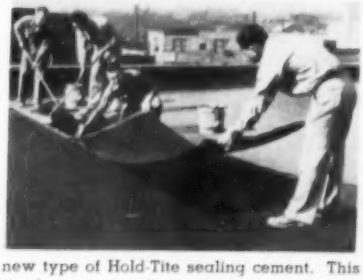
The "Jim Dandy Jr." weighs only 860 pounds and is easily portable in a pickup truck. It has a lifting capacity of 800 pounds and elevates the 2½' x 8' working platform, fully loaded, to a height of 10'. Elevation and lowering of the platform is done by a hydraulic pump powered by a ⅓ HP electric motor controlled from the scaffold platform. The unit is mounted on casters for easy movability on the job.

IMPROVED REROOFING MATERIAL

(Use Key # 917 on Inquiry Card on page 1)

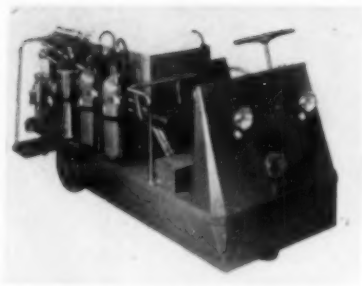
IMPROVEMENT of its Vulca-Dek system to simplify installation work and further reduce re-roofing costs, is announced by The Monroe Company, Inc. The process permits installation of new roofs right over old ones. It eliminates the necessity for removing old roofs and does away with heating of roof coating, hot mop applications and use of gravel. Consequently, there is no fire danger.

Basis of the improved Vulca-Dek method is the recent development by Monroe of a



new type of Hold-Tite sealing cement. This employs new plastics which render it even more adhesive than its predecessor materials. It is said to virtually vulcanize new felt to old surfaces in addition to bonding individual felt piles firmly together.

Other products employed in the Vulca-Dek method are: heavy-duty, asphalt-saturated 53-lb. roofing felt and Siliconed Rufferseal. The latter is spread completely over the surface as the final step in installation of new built-up roofs. These can be constructed in either single or 2-ply types.



PLANT FIRE TRUCK

(Use Key # 918 on Inquiry Card on page 1)

A THREE-WHEEL, electric-powered industrial fire truck that can carry four or five men and a large assortment of fire-fighting equipment, yet easily makes sharp 90-degree turns in one swing in factory aisles as narrow as seven feet, has been developed and produced by the Electri-Car Division of Victor Adding Machine Co. Powered by batteries which feed a specially built 24-volt direct-drive motor, the new fire truck is always prepared for emergency action. A built-in charger makes it easy to keep batteries ready to deliver full power instantly.

Automatic lights and siren go on the moment the stand-up driver steps on the safety treadle. The brake sets and power is cut off automatically as soon as the driver steps off his position, the manufacturer claims. The truck can carry all the equipment needed including two hundred or more feet of hose, three nozzles, six to eight large extinguishers, two to six small extinguishers, asbestos gloves and blankets, axes, flashlights and helmets. Its features may be adapted to the purchaser's requirements.

PHOSPHORESCENT SAFETY PAINT

(Use Key # 919 on Inquiry Card on page 1)

WHEN your plant or outside area is plunged into darkness—no matter what the cause—all objects sprayed with M-M-A GLO-SPRA are immediately visible and thus, many hazards are avoided. GLO-SPRA glows automatically. There is nothing to turn on—no element of mechanical or human failure.

The pigment used in the product insures an immediate, bright afterglow when light source is removed and emits sufficient light to identify the object or area sprayed—for hours. Five to ten minutes of expo-

sure to light, sunlight or artificial, reactivates the paint.

An even coat of the phosphorescent paint is easy to apply from the aerosol container. Indoors it will last indefinitely. Outdoors in a protected or semi-protected area and covered with a coat of SPRITZIT Clear Weatherproofing Coating, it will last over a year. The paint is said to be non-radioactive, and non-toxic.

FACE-UP LIFE JACKET

(Use Key # 920 on Inquiry Card on page 1)

GENERAL Textile Mills, Inc., has announced the new, improved GenTex Life Jacket with exclusive "face-up" action, for the protection of all who work on or near the water. This patented device gently turns the wearer over in the water, face up, at a proper floating angle. Even if stunned, unconscious or otherwise unable to swim, the wearer will stay safely afloat, the manufacturer states.

The exclusive molded plastic foam construction is non-absorbent; it cannot waterlog. Built for hard use, the jacket is not affected by wetting, sitting on or exposure. No special care is needed. Due to slipover design and the adjustable, grip-buckle side strap, the Life Jacket is easy to slip on and off, yet it holds securely in place and cannot come loose. Light and comfortable, it does not interfere with the free, vigorous movement needed by bridge, ship or dock workers.

POWERED DOCK BOARD

(Use Key # 921 on Inquiry Card on page 1)

LITE-LINE Metal Industries Division of Copperloy Corporation has announced a new powered dock ramp, especially designed for low docks (under 48") commonly found in older buildings. Use of the new ramp eliminates expensive excavations or alterations to the dock. It is simply bolted to the dock surface and can be installed in 30 minutes.

The Lite-Line Ramp is made of steel

and is hydraulically operated. Four motions are provided—the forward edge can be raised or lowered to accommodate truck beds up to 14 inches higher than the dock. There is a 15" horizontal travel motion which permits the ramp to be retracted, behind the edge of the dock to prevent damage while trucks are spotted at dock edge. The ramp can also be pulled back to permit closing dock doors. The standard model is five feet wide and ten feet long.

A flared apron at the dock end is hinged and is designed to stay flat, regardless of the elevation of the ramp. The lip, at the forward end of the ramp, rests on the truck bed, relieving the lifting mechanism of the load when vehicles travel across the ramp.

In the lowered position, the ramp is only five inches thick at the highest point, and when fully raised, the slope is gentle enough to permit travel of low underclearance walkie trucks. Standard models are available in 6000-lb. and 12,000-lb. capacity.

FLASHER BARRICADES

(Use Key # 922 on Inquiry Card on page 1)

A NEW all-steel folding traffic warning barricade, for use with Flasher Safety Lights, is announced by R. D. Fageol Company. Known as Model B, the new barricade is suitable for traffic control around hazardous locations on construction, public utility and road repair jobs. Readily portable, the folding barricades can also be used by law enforcement and civil defense units at accident and disaster scenes it is claimed. The unit is compact and easily stacked when folded.

Finished in highway safety yellow or white and black for maximum visibility during daylight hours. Model B barricades are designed for use with Flasher Safety Lights for after-dark traffic protection. Reflector tape is also available. Battery-powered Flasher Safety lights produce neon flashes, said to be visible for over 1 mile, at a rate of 90 per minute. Heavy duty Flasher Safety Lights, fitted with special 8-cell batteries, flash continuously and require battery replacement only once every 60 to 90 days, the manufacturer states.

Model B barricades feature a one piece heavy gauge steel body, with folding angle iron legs secured by toggle locks. Mounting brackets for Flasher Safety Lights also enclose the toggle leg locks and prevent collapsing of the barricade by vandals. Barricades are available in two sizes: 48 and 60 in. long, both 36 in. high.

LOW COST ALARM SYSTEM

(Use Key # 923 on Inquiry Card on page 1)

ZONALARM, a specially designed fire alarm system to meet the needs of large homes, small businesses, stores, supermarkets, motels and semi-commercial buildings, has been announced by The Edwards Company, Inc. The system is said to be a low-cost, completely automatic fire warning and locating unit offering many features of more expensive systems.

Zonalarm goes into operation when fire starts or heat rises, closing thermostatic detectors on the ceiling. These UL listed, easy-to-install detectors are placed in all potential fire-hazard areas and are fully automatic, self-contained and self-restoring. Each protects up to 400 square feet of unrestricted area. Lighted lucite windows on a centrally located indicator panel show the location of the fire, and a self-contained bell sounds loud warning signals. The circuit and alarms associated with each zone window may be individually tested for battery operation, system wiring and power source. The power unit (containing a UL listed transformer, relays, wiring terminals and a battery compartment) may be mounted in any convenient location—usually the basement. Both the indicator panel and the power unit are completely pre-wired at the factory.

The Zonalarm system will automatically switch to battery operation should the standard power supply fail for any reason.

SOLVENT VAPOR DEGREASER

(Use Key # 924 on Inquiry Card on page 1)

DEVELOPMENT of an exceptionally low cost solvent vapor degreaser has been announced by Tect, Inc. Eliminating the fire hazard of gasoline, naphtha, and mineral spirits, the unit is designed for use in garages, service stations, electrical repair operations, plant maintenance and small production.

Described as the Model #10 Solvent Vapor Degreaser, the machine is constructed of 14 gauge steel with a heavy zinc coating and is heated with a Chromalox #1250 watt element which may be connected to an ordinary 115 volt outlet. A stainless steel coil maintains the vapors of the Chlorinated Solvent at the proper level. A work rest and a light-weight, galvanized steel basket, an "on-off" switch and a thermometer are also provided. The bottom is insulated with asbestos and fibreglass.

The unit includes inlet and outlet hoses for quick connection of the condenser to tap water supply. It will clean a minimum of 100 lbs. of steel per hour in the clean vapors of non-flammable Vythene, Perchloroethylene, or Trichloroethylene. Only 1½ gallons of solvent are required for operation. The inside diameter is 14½ inches and the vapor cleaning height 10½ inches.

PACKAGED CARBON DIOXIDE SYSTEMS

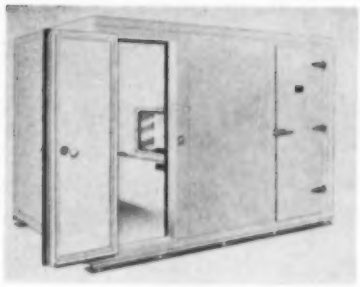
(Use Key # 925 on Inquiry Card on page 1)

NEW packaged carbon dioxide fire extinguishing systems for industrial spaces containing normal flammable liquids have been announced by Walter Kidde & Company, Inc. These systems are available in sizes ranging from ten to three hundred pounds of carbon dioxide. Also available are local and remote manually-operated actuating controls with the larger automatic systems.

These packages contain all the components needed to install an automatic system which will protect rooms of from 140 to 6000 cubic feet. One or more carbon dioxide cylinders, rate-of-temperature-rise fire detectors with connector tubing, automatic control and discharge heads with a manual actuating device, Multijet discharge nozzles, cylinder supporting frame, and instructions are included.

Pipe and fittings for each size system, packaged in individual boxes, can be ordered separately. Also available are accessory items such as remote control pull boxes, alarms operated by the pressure of the discharging carbon dioxide, and other pressure-operated trips and switches used to close doors and windows or turn off electrical equipment and machinery.

All operating parts are enclosed for safety and they require no outside power source. Easily tested and with no parts needing replacement after operation or test, these systems have visual indicators which show if a system is "set" or "released."



AUDIOMETRIC EXAMINATION ROOM

(Use Key # 926 on Inquiry Card on page 1)

INDUSTRIAL Acoustics Co., Inc., has unveiled the latest edition to their line of audiometric examination rooms. The room combines both an examination area and a control area complete with ventilation in one single uniform structure. The I. A. C. series "400-CT" rooms have both the control and examination areas mounted on a common soundproof floor which floats on rubber in shear vibration isolator rails.

A special feature of this unique double room is that the specially designed septum panel which divides the examination area and control areas has the same acoustic transmission loss as the outer walls.

NEW TYPE MASK

(Use Key # 927 on Inquiry Card on page 1)

AN "ATOMIC AGE" military protective mask, devoid of any outside canister, has been developed by the Army Chemical Corps and Mine Safety Appliances Company. The new mask will protect the wearer from radioactive particles as well as a wide variety of war gases. Instead of the hose and canister, the new mask has two pouches, one on each side of the facepiece. In these pouches are pads of gas-aerosol filter material. This filter material is composed of finely ground charcoal, plastic and glass fiber. Although it offers great protection, it gives less resistance to breathing than the former canisters.

To this comfort in breathing is added comfort in fit, and wide-angle, no-fog vision, extremely important in tropical or arctic regions. A speaking diaphragm, built into the mask, enables the wearer to converse and use a telephone or radio without special equipment. The new mask, designated the E-13, can be worn for long periods of time. Although the filter packs can be used for relatively long periods, they provide an excellent "throw-away" packet in the event they are used through an atomic fallout, since the contaminated material is gathered inside the packet.

TWO NEW GLOVES

(Use Key # 928 on Inquiry Card on page 1)

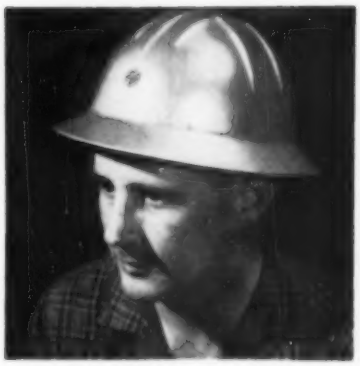
THE Pioneer Rubber Company, manufacturers of Stanflex industrial gloves, has announced two new additions to its line: (1) A knit wrist, fully-coated glove in women's sizes; (2) A new, longer (14½-inch) fully-coated gauntlet for men (illustrated).

Each glove has a coating of tough, wear-resistant Pylox (TM) over a lining of Soft-nap knit jersey for maximum comfort and service life. The vinyl Pylox coating actually outwears leather and cloth, protects the gloves against tears, snags and punctures as well as deterioration from oils, caustics and acids. The gloves are shaped to give ample finger freedom while the specially-tapered gauntlet cuff adds to the comfortable fit. The patented single seam lining eliminates many of the annoying irritations caused by seams rubbing against the palm, thumb, back of the hand or along the fingers. In addition, there are no weak points to wear through quickly. Among the many applications recommended for these Stanflex gloves are handling sheet metal, pipe, clay and concrete products, bulk chemicals or lumber as well as for a variety of general industrial uses including grinding, painting and trucking.

SAFETY HAT

(Use Key # 929 on Inquiry Card on page 1)

THE ALUMIHAT, an aluminum safety hat, exceeds Federal Specifications for construction workers' hats, including both impact resistance (drop ball test) and penetration strength (plumb bob test), passing all requirements except for insulation resistance, according to the manufacturer, Jackson Products, Air Reduction Sales Co. The hat shell is formed in one piece from a special heat-treated aluminum alloy and is reinforced with ribs and cross-ribs. It is anodized to a soft finish that reflects heat without undue glare. The six-point suspension headgear is a soft and pliable unit, shock absorbent and comfortable. It is buttonholed inside the hat shell for easy removal. The headband with clearly marked hat sizes can be adjusted quickly and easily. Chin straps and winterliners are available.



HEAT-RESISTANT PAINTS

(Use Key # 930 on Inquiry Card on page 1)

THE addition of three new colors to its line of C-I "Extra High" heat resistant paints is announced by Chem Industrial Co. Formerly offered only in aluminum, it is now available in gold, metallic red and metallic blue. All four shades are said to resist temperatures up to 1700° F without flaking, blistering or burning.

Each C-I "Extra High" coating is composed of a clear silicone base with a special metallic pigment. This combination air dries to a bright finish in approximately 30 minutes. Then, when heated, it is reputed to virtually fuse with the surface upon which it is applied.

According to the manufacturer, "Extra High" forms a metal coating that resists moisture, corrosion, mild acids, alkalis and industrial fumes. It is recommended for use on condensers, heat lines, ovens, compressors, engine heads, mufflers, radiators, stoves, exhaust manifolds, etc. Because of its unusual heat resistance, it can also be applied over many surfaces heretofore regarded as "unpaintable." It can be applied by either brush or spray gun. It is available in quart and gallon cans, and 5-gallon pails.

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3
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from the CARELESS ACTS of others the WISE MAN corrects his own
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The new headgear is constructed of exceptionally long-wearing high-impact vinyl compound. It is impervious to perspiration or chemical action and is easily cleaned.

This headgear is now available on all CESCO welding helmets and face shields. It is illustrated here with the new CESCO #438-FT Face Shield.

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